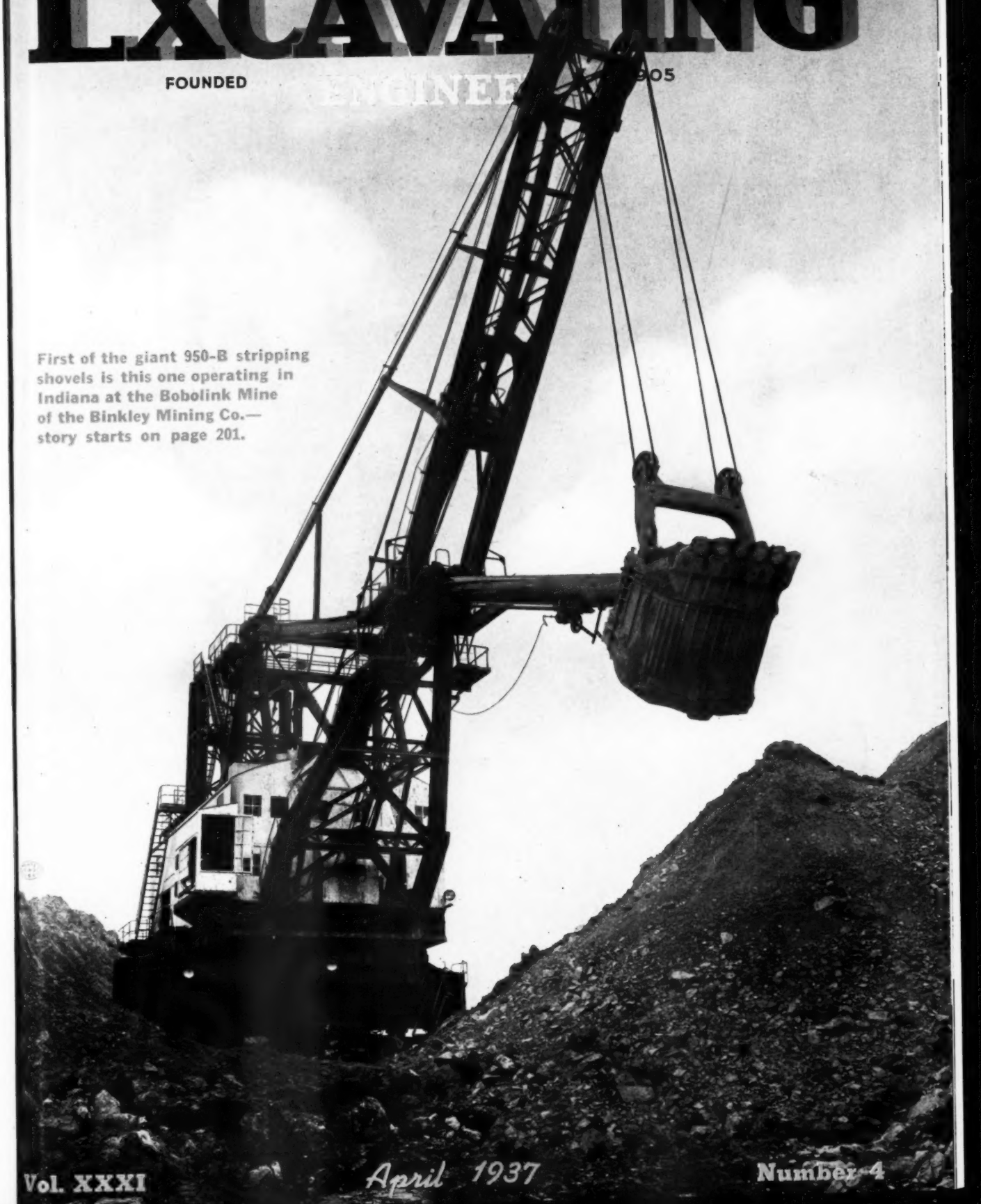
EXCAVATING

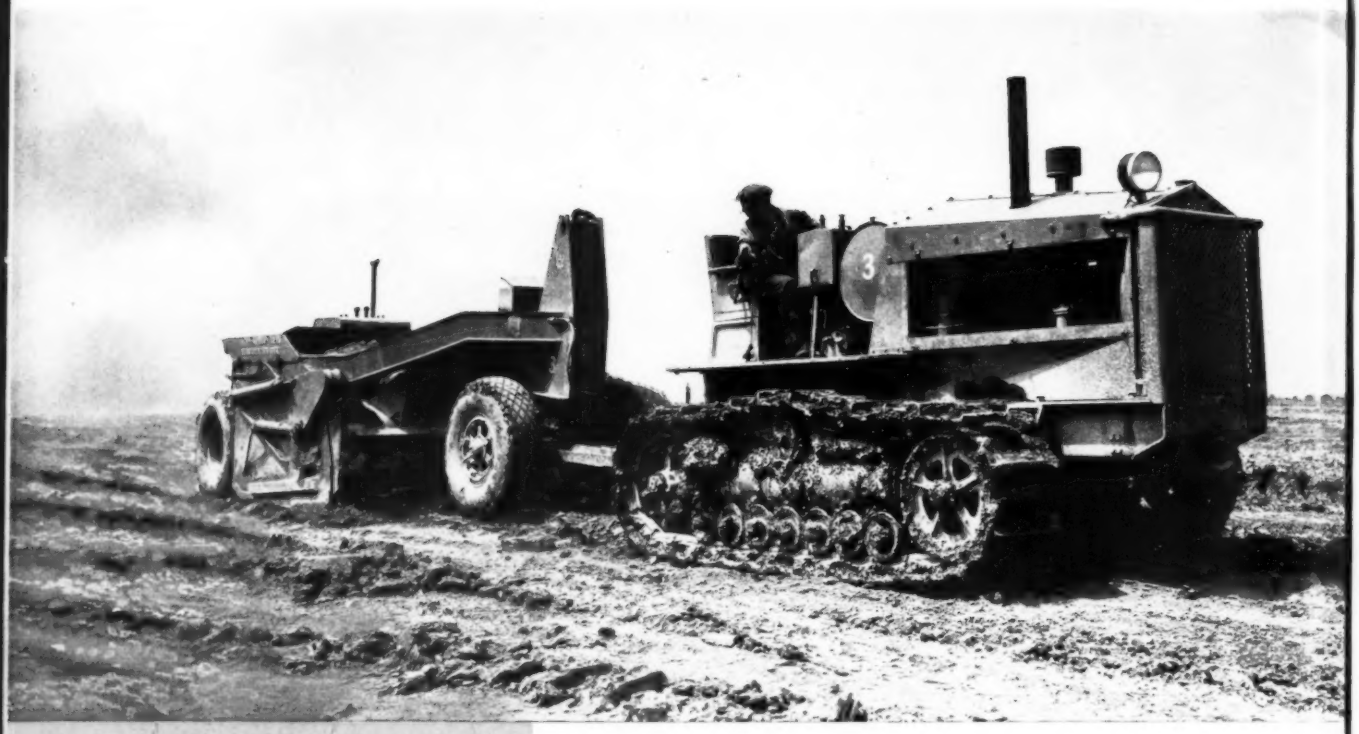
FOUNDED 1905



First of the giant 950-B stripping shovels is this one operating in Indiana at the Bobolink Mine of the Binkley Mining Co.— story starts on page 201.

Vol. XXXI April 1937 Number 4

Two NINE HOUR DAYS IN *One*



Only Cletrac has the advantages of **CONTROLLED DIFFERENTIAL STEERING**

JACOBSON AND McKINLEY believe in nine hour days for their Cletracs—nine hours before noon and nine hours after noon.

"Pleased—well pleased," they say in telling how two Cletrac diesel models F D have worked 18 hours per day for six months hauling 12-yard scrapers on an airport job at Latrobe, Pa. And for a good measure of praise they add "We have been operating two other 94 H. P. Cletracs constantly for over a year."

Whatever the job, the dependability of Cletracs makes for low cost earth moving . . . their ease of handling helps to get more work done, at lower cost. When you have a tough job—count on Cletrac.

THE CLEVELAND TRACTOR CO.
CLEVELAND, OHIO

CLETRAC CRAWLER TRACTORS

EXCAVATING

contents

Vol. XXXI April 1937 No. 4

20th Century Giant . . . . . Front Cover

The first of the revolutionary Bucyrus-Erie 950-B's is in use at the Bobolink Mine of Binkley Mining Company in Indiana. Story begins on page 201.

Stripping Coal At Bobolink 201

Eight miles east of Terre Haute, the Binkley Mining Co. is taking 2000 tons of strip coal a day out of the Bobolink Mine. Long a leader in the stripping game, Binkley was the first company to use the new 30-yard 950-B.

But You Never Know—By Frederic Brown . . . 208

Canal digging was new to salesman Williams, but its problems were easy for his giant intellect.

Rip-Rap For Imperial Dam—By Jos. C. Coyle . . 212

Stringfellow Brothers use three Bucyrus-Erie shovels in quarrying, loading and hauling stone for dam and desilting plant.

Editorial 216

Cutting Diversion's "Profit" 216
Continued Construction Rise 216
H. A. Light 217
Harry Helt 217

Equipment You Ought to Know About 218

Bucyrus-Erie 4-Wheel Scraper 218
Won-way Truck Body 218
Hayward Clamshell Bucket 218
Concrete Bucket 219
Onan Generating Plants 219
Automatic Locking Nut 219
International Harvester Trucks 219

Not in the Contract 220

Field Notes 222

Minimum Depth Requirement 222
Paper Fasteners Maintain Button Holes 226
Emergency Bushing 226

Shots from the Firing Line 228

Dredging on the Rand 228
Work Speeds Up at Grand Coulee 230
Erosion Control Protects Highways 234
Mineral Industries Safety Awards 234
Bridge Award to Lewis-Chambers 236
New A. E. D. Officers 236
Birmingham Dam at Half-way Mark 236
Salmon River Cut-Off 238
Aqueduct Completion Month 242
New St. Lawrence Bridge 242
Puffed Wheat for Highways 242

Ex-Laughs 243

Book Reviews 252

Trade Notes 254

LOOKING AHEAD

This interesting article will appear in an early issue of* EXCAVATING. *Watch for it.

Beach City Dam

The excavating story of William Eisenberg & Sons job on one of the Muskigum Valley conservancy District projects—another step in taming the Ohio and Mississippi rivers.

Published Monthly by THE EXCAVATING ENGINEER PUBLISHING COMPANY, South Milwaukee, Wisconsin, U.S.A.

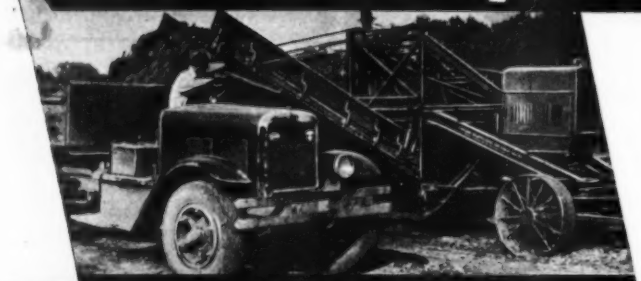
CCA Member Controlled Circulation Audit

F. O. WYSE, *Manager* — D. B. REED, JR., *Associate Editor*
ARNOLD ANDREWS, *Editor* — RALPH H. DIEHL, *Assistant Editor*
E. M. HEUSTON, *Advertising Manager* — JOHN I. MORAVEC, *Art Director*

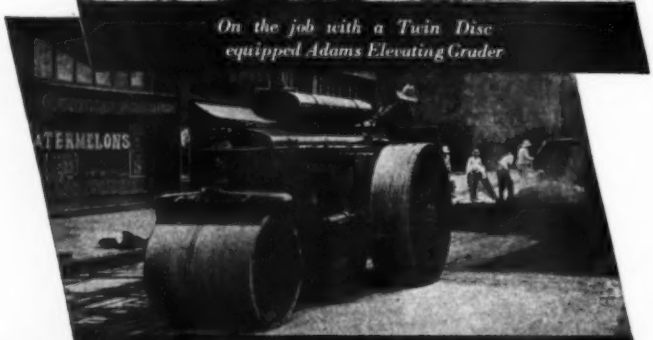
Regular subscription: 25 cents per copy, $1.00 a year; Canada and foreign, subject to publication policy, $2.00 per year. Special subscription: Upon application on card inserted in this number this publication will be sent frequently (not regularly) free of charge, to companies, executives and supervisors engaged actively in the industry of excavation.

COPYRIGHT 1937 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

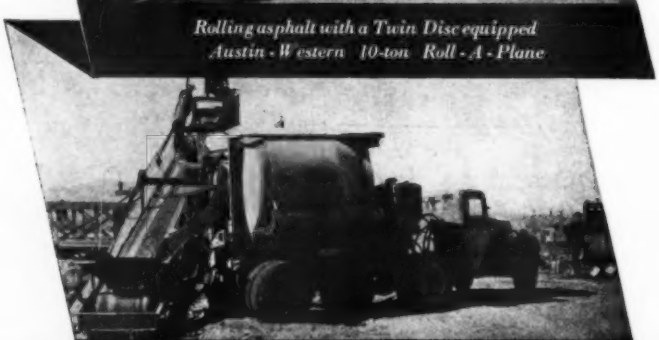
A SMALL PART... WITH A *Big Reputation*



On the job with a Twin Disc equipped Adams Elevating Grader



Rolling asphalt with a Twin Disc equipped Austin-Western 10-ton Roll-A-Plane



Rex Moto-Mixer, Twin Disc equipped, at work on the Colorado Aqueduct

Ord Concrete Finishing Machine, Twin Disc equipped, at work near Huntington, Pa.

● **It is no mere coincidence that road building machinery equipped with Twin Disc Clutches and Power Take-Off Units is more responsive to control, does a better job, in less time, with little or no time out for shut-downs.**

Rugged and reliable . . . combining capacity with compactness . . . Twin Disc Clutches and Power Take-Off Units transmit full engine horsepower smoothly and effectively, at high or low speeds, with easy pick-up and release . . . and without slippage or undue wear. Twin Disc patented adjustment permits simultaneous take-up on all levers without the use of tools.

The fact that fully 95% of *all* road building, material handling and construction machinery used in the United States is Twin Disc equipped . . . proves that they have earned their established reputation for leadership.

Write the Twin Disc Engineers for specific recommendations on *your* clutch problems. Engineering data on request. No cost or obligation.

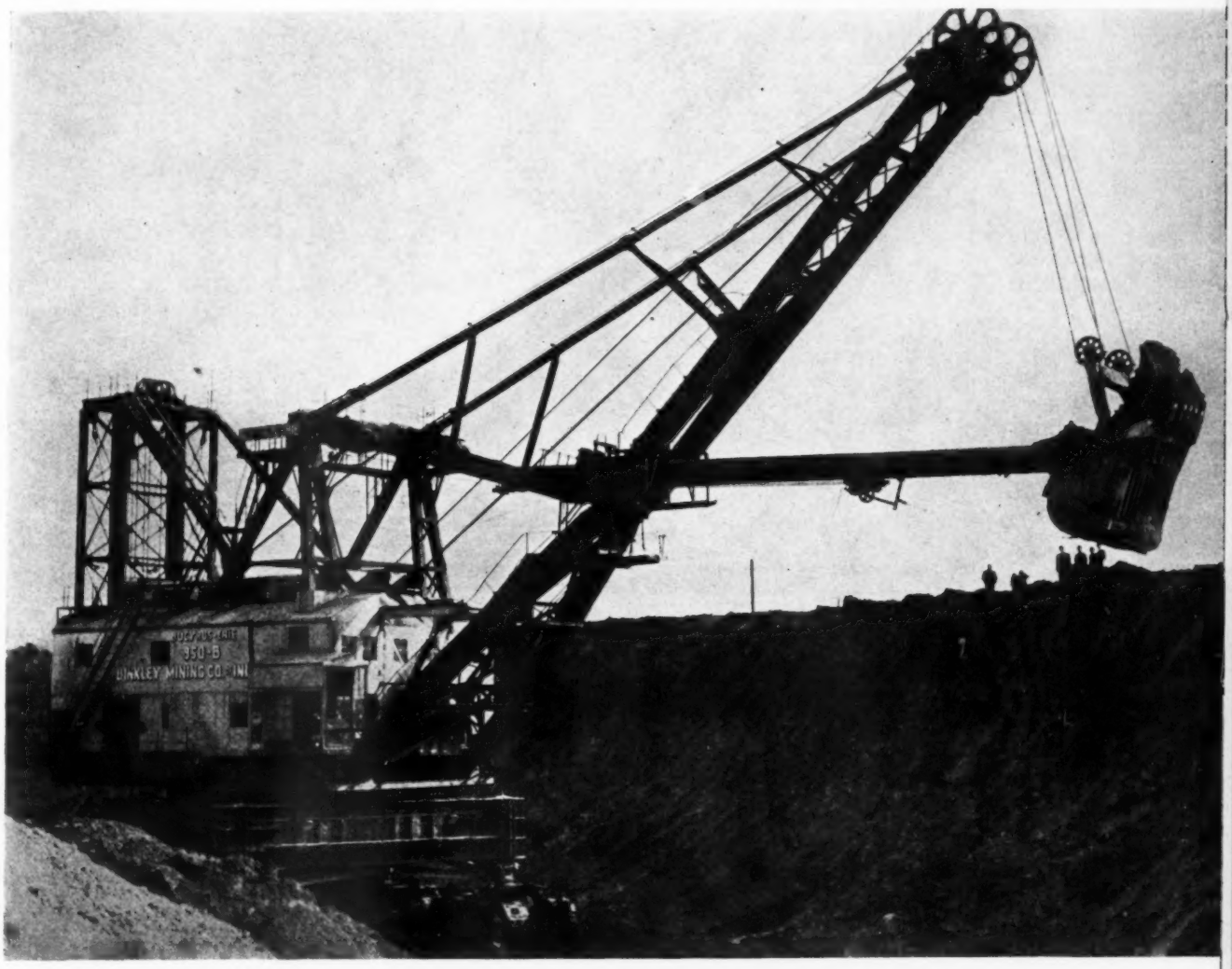
TWIN DISC CLUTCH COMPANY
1335 RACINE ST. RACINE, WISCONSIN

No. 7963 Twin Disc Power Take-Off

TWIN DISC CLUTCHES

For your convenience in writing to Twin Disc Clutch Company, you will find a card bound in this issue.

STRIPPING COAL at BOBOLINK



Binkley Mining Company Uses First of New Type Giant Stripping Shovels in Uncovering 3-foot Seam in Indiana

STARTED in 1926 by L. G. Binkley and Hubert E. Howard, the Binkley Mining Company is the Indiana operating organization of the Binkley Coal Company—long a leader in strip mining through its Illinois operating organization, the Pyramid Coal Company. The first operation of the Binkley Mining Company consisted of taking over three shaft mines, producing Indiana No. 3 and No. 5 coal, from the Bogle Estate near Clinton, Indiana. When it was decided to open the Bobolink Mine, in 1935, a Bucyrus-Erie 950-B was purchased, and Bobolink became the first mine to use this revolutionary new stripping shovel.

Sales agent for Bobolink coal is the Binkley Coal Company, which will ship three million tons of strip coal in 1937, in addition to a large tonnage produced from other mines. Being used principally in Indiana, Illinois, Iowa, South Dakota, Minnesota, and Wisconsin, Bobolink coal is an excellent Fourth Vein coal, particularly desirable because of the unusually high fusion temperature of ash.

To get to the Bobolink Mine from Terra Haute, drive eight miles east on Route 40, which will take you into the town of Seelyville. Then turn south—taking note of the tavern on the corner, because you can get extra-special barbecued beef there—and high-

● The revolutionary new stripper pictured above is the last word in giant shovels. It can dump that full dipper 226 feet from where the dirt was dug; could dump it on top of a seven story building; could dig out a bank as high as a nine story building.
On the opposite page are four close-ups of revolutionary features of this modern shovel. At upper left, note heaping dipper, new cylindrical dipper stick and twin hoist ropes and sheaves. At the right is shown the moving counterweight, an important weight-reducing, power-adding factor. Operator's station, handle and dipper bottom are illustrated at lower left. Weight requirement for this new handle is 40 per cent less than on previous machines. Note at lower right how dipper stick is welded directly to the back of the dipper for extra strength and lightness.

ball straight ahead for a little over a mile.

The spoil banks of the 7000-foot pit will be what you'll see first, before you get to the mine office. Somewhere near the east end of the pit (if you get there before the center of operations is changed) you will see the twin boom-point sheaves and boom tip of the huge 30-yard shovel rising above the miniature mountain of the spoil bank. If you're familiar with the old-style stripper, the glimpse of even this much of the boom will tell you that here is something different.

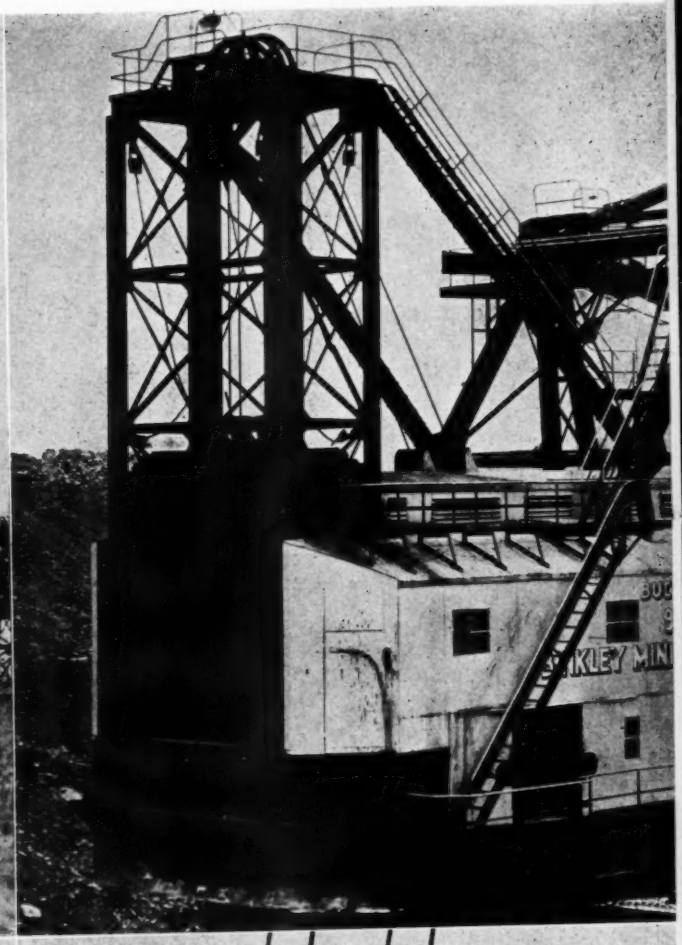
Prospecting Outlines Coal Seam

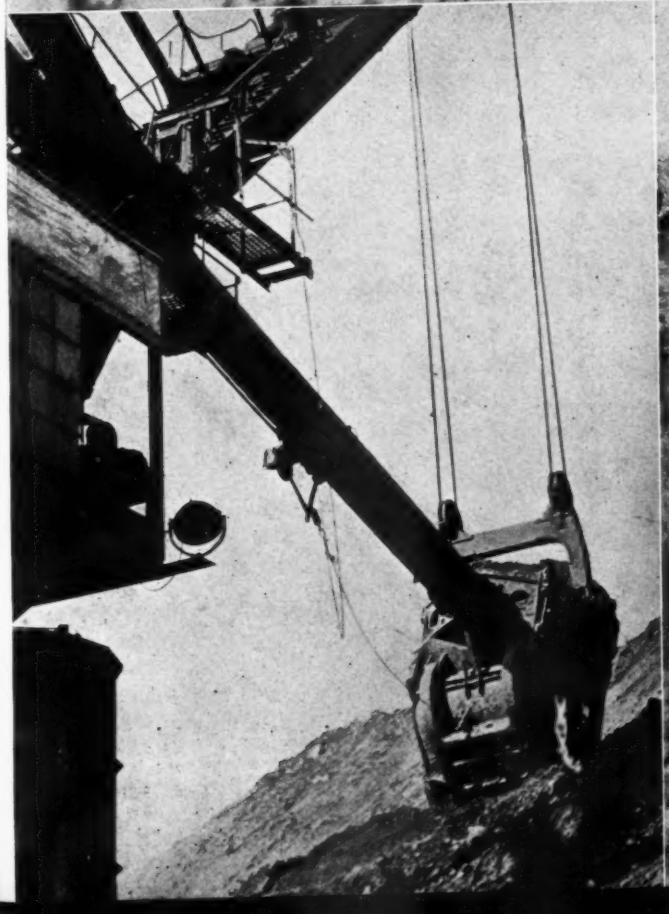
The Bobolink Mine is a comparatively new, modern operation, stripping having begun in November, 1935. The property includes about 1000 acres, underlaid by a 3-foot seam of Fourth Vein coal. Up to January 1, 1937, 113 acres had been stripped. Before equipment was purchased, the property was thoroughly prospected by the Binkley Engineering Department. Hand-drilled test holes, 800 of them, ranging in depth from 15 to 60 feet, were put down. The picture emerging from these test holes showed the 3-foot coal seam to be tipped up at the edges like a cross section of a saucer. Overburden ranged in depth from 30 feet at the edges of the seam to 60 feet near the center, with an average depth of about 45 feet.

A cross section of the overburden is fairly uniform in character, and runs as follows: Eight to 10 feet of sandy surface soil, two to three feet of sand and gravel; 10 to 15 feet of hardpan; and a balance immediately above the coal of shale or sand rock. With a relatively large amount of overburden to be moved, and a narrow coal seam, two principal things had to be achieved for profitable operation. The stripping shovel had to be fast and economical, and a high percentage of coal recovery had to be maintained.

The new 950-B which had just been developed by Bucyrus-Erie, with its revolutionary combination of lightness, power and speed seemed ideal to meet the needs of the situation.* Because of the importance of stripping to this operation and because of the unique advances incorporated in the machine, it seems proper to devote considerable space to a description of this new stripper. General operating methods with which maximum efficiency in coal

*A description of this machine appeared in the December, 1935, issue of EXCAVATING.





recovery is obtained will be discussed later in the article.

The Bobolink 950-B, the first of six machines of this type now in use in the United States, has been operating long enough to show its capabilities, and the Binkley management tells us the new features of construction have been well tested and their value clearly indicated.

What It Looks Like from the Bank

Our second glimpse of this new stripper came when we drove around the east end of the pit to get to the high wall—the best place from which to get a general view of the pit operations. From the road, the body of the 950-B was hidden by the bank. The section of boom, A-frame, and counterbalanced hoist which were visible were strikingly reminiscent of the steel superstructure of a modern bridge. The boom construction may be best described by considering it in upper and lower sections in line with its functional purpose. The lower boom, which takes the loads imposed by the shipper shaft, is of rigid, structural steel construction, incorporating the revolving frame and the A-frame as an integral unit with it through steel strut connections. The upper section of the boom which takes the much lighter loads imposed by the boom point sheaves, is a lighter and more flexible triangular extension, the lower members of which are the upper members, or struts, of the base "bridge" or lower boom. As you stand on the bank and look over this new type of boom and make mental comparisons with the strippers of former years, you are immediately impressed with the unique combination of lightness and strength which has been achieved in this completely new type of construction.

The dipper handle, visible from the bank as a heaping load is swung over to the spoil pile, is also a striking departure from the previous type. It is a single, cylindrical unit welded directly tc the dipper-back, and affording an increase in strength together with approximately a 40 per cent reduction in weight from former handles. All torsional stresses imparted to dipper and handle in digging are transmitted directly to the twin hoist cables, leaving the handle free to roll in the saddle block. The latter consists of two steel castings, keyed and bolted together, through which the handle slides freely. Weight of the handle is taken by a concave roller mounted within these castings and on the shipper shaft. Spring-loaded sidebuffers cushion and limit side deflection.

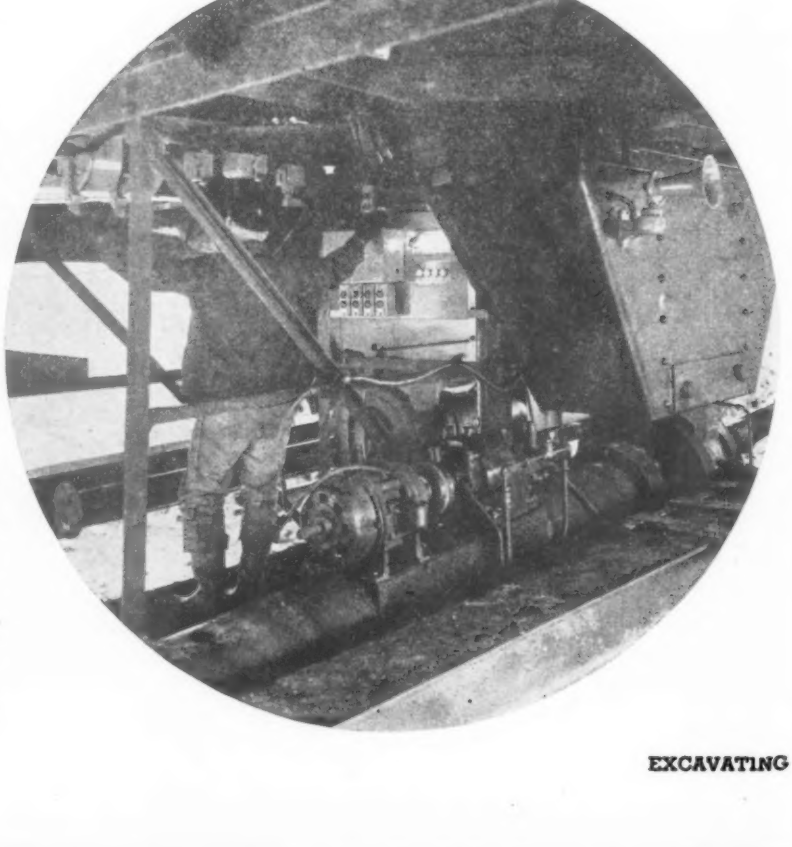
The combination of light weight and strength is maintained in the modern dipper. Shaped to fill and dump fast, this 30-yard dipper is broad across the face, with teeth and lip designed to give remarkable accuracy in uncovering the coal seam.

The counterbalance tower resembles an open elevator shaft in which the counterweight rises as the dipper goes down, and falls as the dipper rises. This type of moving counterbalance is not new with the 950-B, having been successfully used in the Bucyrus-Erie 750-B since 1930. On that machine, it proved so effective in increasing speed and digging power, and at the same time decreasing weight and total power consumption, that we are told by Bucyrus-Erie engineers its inclusion as a fundamental feature of the 950-B was a matter of course.

When we left the road, and walked over to the edge of the high wall, we could see the operations going at full swing. The stripper was working in about 60 feet of overburden, taking a cut 30 feet wide in the bottom. Working on about a 120-degree swing, the machine was making a digging cycle in from 45 to 50 seconds.

Dipper Climbs Through Bank Easily

No blasting of overburden is necessary, the dipper slicing up through the material without trouble. "It's the first dipper we've seen that doesn't wobble when it's taking a tough bite," we were told by several of the



● From this station beneath the base of the shovel, the ground operator touches a control board and moves the giant machine through four individual motors on the caterpillar-type traction units. Steering is hydraulic. The horn at the right gives the move-up signals from the digging operator.

operating men when we commented on the steadiness with which the dipper went up through the bank.

A Caterpillar 22, with a La-Plant-Choate bulldozer, works just ahead of the stripper, piling loose material so it can be most efficiently handled by the shovel. C. F. Hamilton, Binkley Vice President, explained the operating advantages gained through the use of this rig. "With a shovel as big as the 950-B, it is especially important to get as much digging time as possible, and use of the bulldozer saves the shovel time that otherwise would have to be spent in cleanup work." Further, Mr. Hamilton told us, it is inefficient to have the 30-yard dipper remove the dirt completely down to the coal. With a soft seam, the dipper would be bound to score the coal in touching it, resulting in a loss of valuable coal. Consequently, the operators of the 950-B leave a thin layer of overburden on the coal, which is cleaned off by the bulldozer. In addition to the working time gained by the procedure described above, use of the bulldozer means that the cats of the big stripper are always operating on a seam that has been completely cleaned.

While the Bobolink mine was not in the recent flood area, and there was no shut-down in operations, January was entirely too wet a month for comfort or satisfactory operating conditions. It was noticeable, however, that the present wet weather didn't keep the organization from stepping right ahead with the job, and getting out as much coal as possible for a skilled crew, keeping up on their toes to get the most out of their modern equipment.

No Lost Time from Move-Ups

We were particularly impressed, in watching the stripping, by the speed with which move-ups were made. The 950-B is operated by a crew of three men—operator, oiler, and ground operator. The four caterpillar-type traction units are powered with individual motors and are hydraulically steered in pairs from a central platform beneath the machine. When the operator is ready for a move-up, he sounds

Above: An idea of size! The White tractor unit in the dipper is one of those pulling the 16-yard dump trailers in use at Bobolink. Below: The 30-yard dipper gets down to business and heaps another pay load on the spoil bank.

two warning toots on a whistle. The ground operator, who has been acting as a traffic cop, directing trucks past the shovel, jumps to his platform, signals his readiness by sounding a horn. Then just as the swing starts, the digging operator sounds the "go-ahead" signal, the ground operator throws in his controllers, power is fed to the cats, and a six-foot move is made while the swing cycle is being completed.

● If necessary, each of the 6-foot high traction units shown below could be detached and run out from under the shovel under its own power. Units are hydraulically steered in pairs. The coal seam is uneven here, and you can see how the machine has automatically leveled itself. Notice how much more of the jack in the left front is visible than of the one at the right. Ordinarily, move-ups of six feet at a time are made.

By the time the empty dipper is back at the bottom of the high wall, the machine is ready for the next digging cycle to begin without delay.

The remarkable speed with which moves are made is possible because of the automatic leveling system, a unique feature of this new stripper. Four hydraulic jacks, one at each corner of the machine, and so controlled as to give three-point suspension while moving, automatically and instantly level the machine when the ground surface changes. This leveling system operates not only when the machine takes a new position, but whenever the ground shifts beneath the machine for any reason.

On an uneven, or tipped seam, such as the one at the Bobolink Mine, the time-saving afforded by automatic leveling is one of the most important advantages of the 950-B over old-type machines. "It certainly saves us plenty of time," Superintendent Allie Steiger said, in commenting that this was the feature of the machine which impressed him most. With old-type shovels, a ground crew had to level the machine after every move—or every change in the contour of the surface. Since no other stripper has been used at Bobolink, definite figures showing comparative time saving are not available. The importance of the saving is evident, however, when you figure that the 950-B is operated on three eight-hour shifts, six days a week, and moves may be made every hour, with little or no loss in digging time.

Although the stripper does not give an impression of great size from a distance, possibly because of its compactness of design, when you get up on the machine, its dimensions become impressive. The climb up to the level of the operator's cab is about the same as the climb to the third floor of an apartment house.

● Left: B. H. Schull, Binkley general manager; A. E. Steiger, Bobolink Mine superintendent; D. Loudermilk, Bobolink engineer.

Standing behind the operator and looking out over his shoulder, the dipper going up through the bank looks plenty far out. It is difficult to see how it is possible for the operator, with two simple hand levers and one foot pedal, to control that distant dipper so accurately.

Viewing the main "deck" of the shovel, we were particularly impressed with the simplicity of the machinery, and the convenience of the layout for oiling and greasing. The size of the machine is emphasized by the overhead crane provided—just as in a big shop—for moving the heavy machinery when necessary.

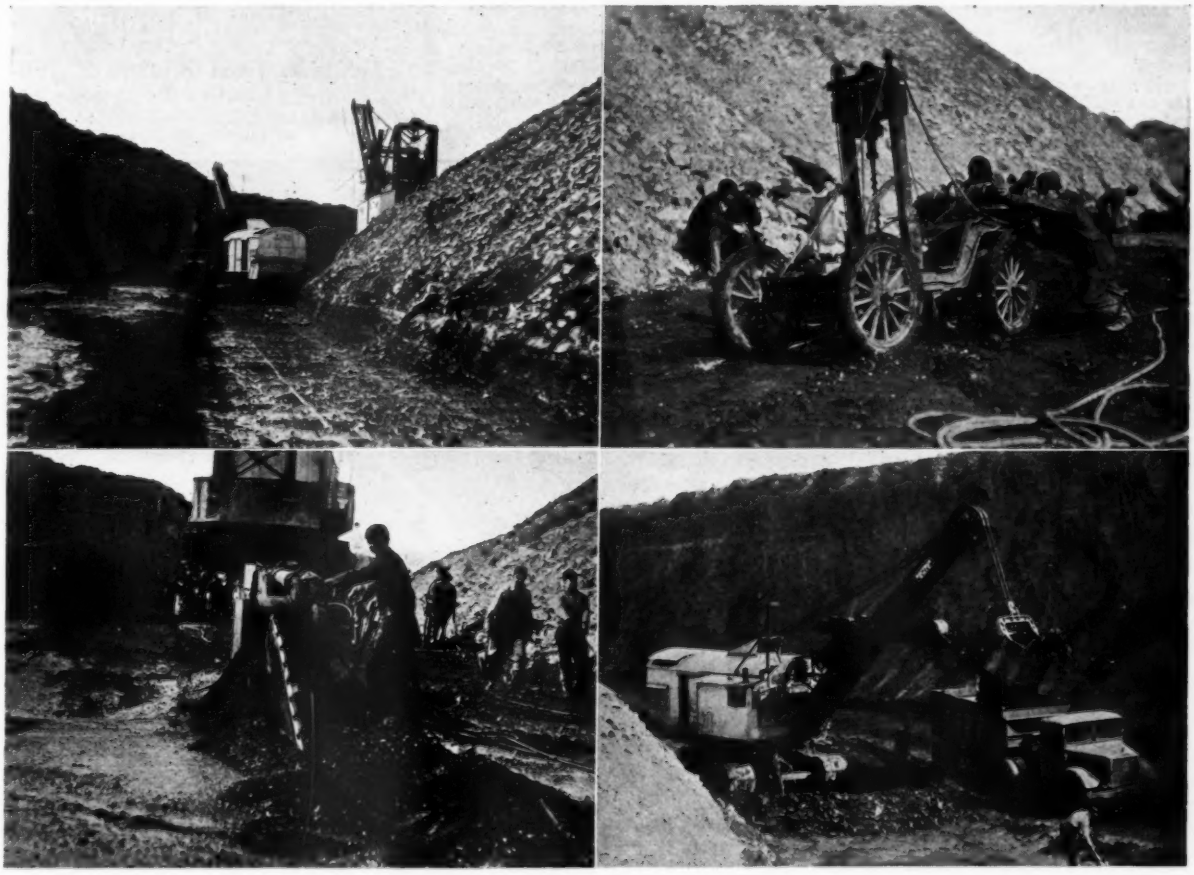
● The group of pictures below show operating details in the pit. The top left view is looking west, with the section of high wall shown about 60 feet high. The clean-cut edge of the berm indicates maximum efficiency in coal recovery. The berm cutting machine, a Sullivan channel cutter, is shown in action below, left. Upper right is the Ford-Chassis-mounted Hardsocg drill which puts down the holes for blasting the seam. Lower right, the 75-B is loading one of the 16-yard Sanford-Day bottom-dump trailers.

Walking Right Through Slides

In view of the fact that slides of the high wall occasionally occur in stripping operations, we asked Superintendent Steiger whether they had had much trouble with slides tying up the big shovel. We had in mind the fact, that, whereas the cats of former strippers covered by slides had to be pretty completely dug out, the ability of this new machine to steer obliquely ought to be of considerable help in walking away from cave-ins with a minimum of difficulty.

"Well," we were told, "we have had slides, and one particularly

(Continued on page 244)



BUT YOU NEVER KNOW

• ". . . has let me in on the ground floor"

William Williams originates a tandem digging plan for shovels, a startling new use for bulldozers, and gets along swimmingly in his canal work. His problems are complicated by a desert salesman and a visiting delegation from the Orient but you never know!

By FREDERIC BROWN

Illustrated by J. A. Patterson

Letter from William Z. Williams, Construction Superintendent, Oskiepoosie Irrigation Alliance, Oskiepoosie Valley, Arizona, to D. Itch, President, The D. Itch Digger Company, Circle Center, Ohio:

Dear Mr. Itch:

The two shovels, the dragline, and the two bulldozers arrived yesterday and already I have them in action to complete the irrigation canal, of which, as you know, I have been made superintendent.

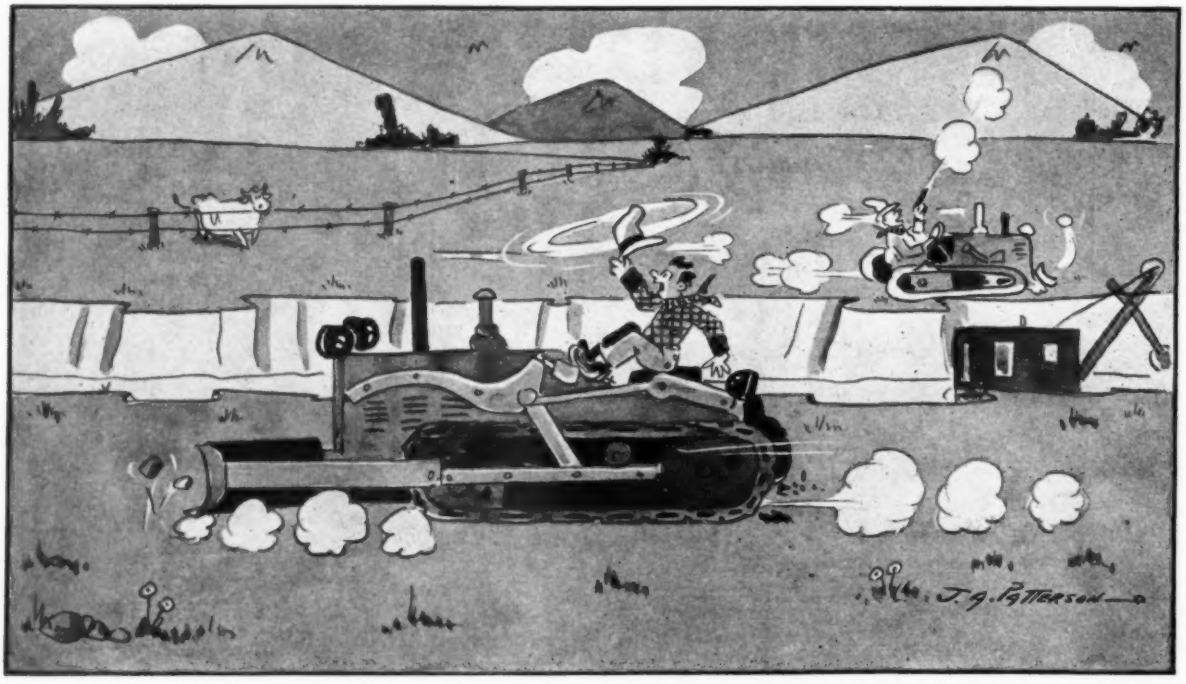
Mr. Burbark, my employer, left for Los Angeles yesterday to conduct other business there. I had counted upon him for some advice, but believe that I can handle matters as well myself. After all, there is nothing complex about digging a canal, is there?

Why he wanted the two bulldozers, I cannot imagine. They look to me like old-fashioned cow-catchers on locomotives, but we have not had any trouble with bulls (or cows, either) falling into the canal. However, since they are here, I have hired two ex-cowhands to drive them up and down the canal bank, one upon either side, and I imagine that this mere display of force, as it were, will doze any bulls that may wander into the vicinity.

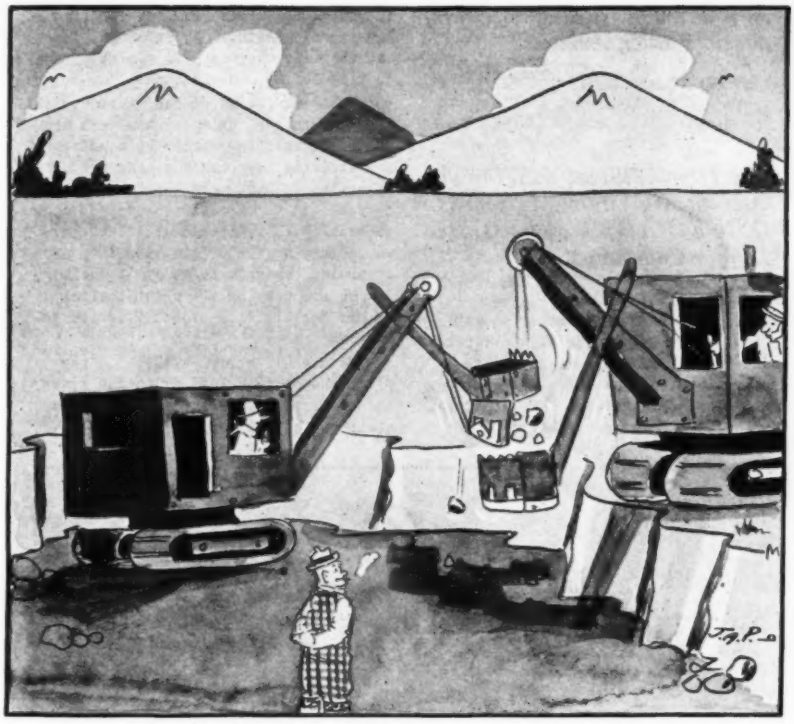
I am first going to carry on for the additional mile that will take us to the Dead Cow River, and then will concentrate my attention upon the system of irrigation canals at the other end, down in the Poosieoskie region.

Cordially yours,
William Z. Williams

Telegram from William Z. Williams, Construction Superintendent, Oskiepoosie Valley,



• ". . . this mere display of force should doze any bulls"



• *". . . a most efficient system—though it took a bit of practice"*

Arizona, to D. Itch, President, The D. Itch Digger Company, Circle Center, Ohio:

CAN YOU SUPPLY FOUR YARD SCOOP FOR THREE YARD SHOVEL QUESTION MARK WIRE AT ONCE LETTER FOLLOWS EXPLAINING.
WILLIAMS

Telegram from D. Itch, President, The D. Itch Digger Company, to William Z. Williams, Oskiepoosie Valley, Arizona:

CAN SEND YOU FOUR YARD DIPPER STOP HOWEVER THREE YARD MACHINE CANNOT HANDLE FOUR YARD DIPPER EXCEPT IN VERY LIGHT DIGGING. D. ITCH

Letter from William Z. Williams, Oskiepoosie Valley, Arizona, to D. Itch, President, The D. Itch Digger Co., Circle Center, Ohio:

Dear Mr. Itch:

Thank you for your telegram explaining the four-yard dipper situation. Fortunately, due to a rainfall we had recently, a four-yard bucket is no longer necessary.

You see, Mr. Itch, I have our two-yard shovel doing the actual digging down in the canal ditch, and as we do not want to put the earth right on the edge where it can roll back in, we have stationed the three-yard machine on the bank. The two-yard shovel takes up a scoop of dirt, the three-yard one reaches down, and the two-yard one empties its dipper into the dipper of the three-yard one, which then swivels and dumps it as far back from the bank as it can reach. It is a most efficient system, although it took a bit of practise on the part of my operators, who are former sheepherders, and who know about shovels only what I taught them.

I wanted a four-yard bucket for the three-yard machine so it could wait for two dipper-loads from the smaller machine, as this would save time, due to the fact that the sheepherder on the big machine is slow, usually taking about ten minutes to swivel the machine and empty it, whereas the operator of the smaller machine is quite speedy and can scoop up a shovelful in five minutes, more or less.

Due to the rain, though, the problem is obviated. The dirt is so sticky that over half of it stays in the bucket of the two-yard machine each time it digs, so that the three-yard bucket can now wait for two loads before it must go into action.

The general two-shovel system is very efficient, and if it is new you are welcome to tell your other customers and salesmen about it. Between the two shovels and the dragline (which we are not using) we often excavate as much as a hundred cubic yards of dirt a day.

Still no trouble with cattle, although it is a picturesque sight, and therefore worth what it costs, to see my two cowhands patrolling the bulldozers up and down the bank, singing the sad quaint cowboy songs they love.

Incidentally, Mr. Itch, if you have any loose capital you wish to invest, I can make an excellent suggestion. A Mr. Quackenbush, who is staying at a hotel in Phoenix, and who, although he wears spats, is in the truest sense a pioneer of the Great West, has let me in on the ground floor of a wonderful proposition. For the two thousand dollars I had left of my salary with Gigantix Films, I have purchased a hundred acres of land in Painted Gulch.

It is true that to the inexperienced eye this land looks like desert, but Mr. Quackenbush assures me that the land is rich, under the surface, in minerals, and I hope to start mining as soon as I finish this canal. If you wish to invest, write me.

I am eagerly awaiting the return of my employer, Mr. Burbark, as I wish to

• *"They say my excavating method is unique"*

show him the progress being made, and to let him see how efficiently I am handling things. However, he may be away for another month.

Cordially yours,
William Z. Williams

Telegram from William Z. Williams, Oskiepoosie Valley, Arizona, to D. Itch, President, The D. Itch Digger Company, Circle Center, Ohio:

HAVE MADE STARTLING DISCOVERY WHICH HASTEN TO COMMUNICATE TO YOU STOP IF YOU SO DESIRE AND THINK ADVISABLE HAVE PATENTED OUR JOINT NAMES YOU FINANCE ADVERTISING CAMPAIGN AND WE SPLIT PROFITS STOP IT IS THIS COLON THE TWO OUTFITS YOU SOLD ME AS BULLDOZERS WHICH HAVE COWCATCHER ARRANGEMENTS ON FRONT CAN BE USED ALSO AS SCRAPERS TO LEVEL OFF GROUND AFTER SHOVELS HAVE COMPLETED DIGGING STOP THEY WORK REMARKABLY WELL AT THIS SORT OF THING AND BELIEVE THEY WILL REVOLUTIONIZE EXCAVATING IF ENGINEERS FIND OUT ABOUT THEM STOP SUGGEST MILLION DOLLAR ADVERTISING CAMPAIGN WHICH I CAN MANAGE FOR YOU FEATURING THIS USE OF YOUR MACHINES STOP MY COWHANDS QUIT WHEN I PUT MACHINES TO THIS USE BUT HAVE TWO MORE SHEEPHERDERS OPERATING THEM STOP SHALL I COME AT ONCE TO OHIO TO TAKE CHARGE OF ADVERTISING CAMPAIGN QUESTION MARK

WILLIAM Z WILLIAMS

Letter from D. Itch, President, The D. Itch Digger Company, to William Z. Williams, Oskiepoosie Valley, Arizona:

Dear Mr. Williams:

No.

D. Itch

Letter from William Z. Williams, Oskiepoosie Valley, Arizona, to D. Itch, President, The D. Itch Digger Company:

Dear Mr. Itch:

Things have not been going so well the last few weeks, since the telegram I sent you. Your reply was somewhat discouraging, but justified, as I have found out since. Anyway, it was a good idea and hardly my fault that someone else thought of it first, so you need not have been so abrupt about it.

But that, after all is the least of my worries, involving only a wasted expenditure of $17.84 for the telegram.

What is worse, I have had a communication from my employer, Mr. Burbark, which rather profanely hints that he is not in full accord with the methods I have been using, that progress has not been quite so rapid as he had hoped, and that he is coming back to do something about it. He does not say what he intends to do, but I have my suspicions, and I am therefore working my sheepherders in two shifts in order to get as much done as I can to make a good showing.

What is as bad, I have been informed that the land for which I paid two thousand dollars is merely desert, and that it is worthless, although it is just a few miles from the fertile Poosieoskie region. My informant is the sheriff, who was here yesterday inquiring for Mr. Quackenbush.

Yesterday, also, I had other visitors. A group of Oriental business men who are travelling about the country and studying American business and construction methods. They were very interested in the irrigation project and especially in my method of excavating, which they say is unique, and they are returning tomorrow to study it further.

We are working all night tonight, as Mr. Burbark will probably arrive tomorrow.

Before his arrival I hope to complete the section leading to the river, and the irrigation canal system at the other end can be completed later, if Mr. Burbark is not too displeased.

Sincerely yours,
William

• *"All the equipment is under water"*

Telegram from William Z. Williams, Oskiepoosie Valley, Arizona, to D. Itch, President, The D. Itch Digger Company:

JUST REACHED RIVER WHICH FLOWED INTO CANAL DITCH SO SUDDENLY THAT ALL EQUIPMENT IS UNDER WATER WITH ONLY TOPS OF BOOMS OF SHOVELS SHOWING ABOVE WATER CAN YOU SUGGEST METHOD OF GETTING THEM OUT BEFORE BURBARK RETURNS QUESTION MARK UNDERSTAND HE HAS NOT YET SENT CHECK FOR BALANCE OF PAYMENT ON SHOVELS SO THIS IS YOUR PROBLEM TOO MR. ITCH STOP I AM WORRIED STOP VERY WORRIED IN FACT

WILLIAM

Telegram from D. Itch, President, The D. Itch Digger Co., to William Z. Williams:

SO AM I
D. ITCH

Telegram from William Z. Williams, Oskiepoosie Valley, Arizona, to D. Itch, President, The D. Itch Digger Company:

HAVE JUST ASCERTAINED THE DEAD COW RIVER HAS CHANGED ITS COURSE AND FLOWS THROUGH THE CANAL DITCH AND ENTIRE OSKIEPOOSIE VALLEY AND WHAT IS WORSE HAS FLOODED ENTIRE POOSIEOSKIE REGION UNDER ABOUT SIX INCHES TO A FOOT OF WATER AS POOSIEOSKIE REGION WAS LOWER THAN LEVEL OF RIVER STOP THAT MUST HAVE BEEN WHAT MR. BURBARK MEANT WHEN HE MENTIONED DAMMING RIVER STOP I THOUGHT HE WAS SWEARING STOP
WILLIAM.

Telegram from D. Itch, President, the D. Itch Digger Company, to William Z. Williams, Oskiepoosie Valley, Arizona:

IF YOUR EMPLOYER WASNT SWEARING THEN COMMA CHEER UP COMMA HE WILL NOW
D. ITCH

Letter from William Z. Williams, Phoenix, Arizona, to D. Itch, President, The D. Itch Digger Company, Circle Center, Ohio:

Dear Mr. Itch:

As you will notice from the postmark, I am now in Phoenix, being no longer connected with the Poosieoskie Irrigation Alliance. In fact, the Poosieoskie Irrigation Alliance has ceased to exist.

However, things are not so bad as they seem, and I am writing to tell you how it came out, in spite of the somewhat sarcastic tone of your last two telegrams, and the lack of any really helpful suggestions in them. No suggestions were really needed, however, as my own ingenuity was sufficient to solve the difficulties.

Mr. Burbark arrived this morning, and at first he was quite displeased to say the least. But you never know.

While we were discussing the matter, the Oriental gentlemen whom I mentioned arrived to complete their inspection of our American irrigation methods. Mr. Burbark declined to see them, but, on one of my sudden inspirations, I received them courteously and showed them the Poosieoskie region, now under several inches of water, and shimmering in the warm Arizona sunlight.

"Gentlemen," I said, "I understand that the agriculturalists of your country use swamp-land, just like this and much less fertile, to raise rice to export to our country. Here is a real opportunity for someone who understands rice growing. A fertile rice-farm within the very country to which you export rice, and no charges for shipping by boat, no tariff."

They were immediately interested and went to talk to Mr. Burbark, and I learned from him later that they are purchasing the land at a price quite satisfactory to all concerned and that he and the other members of the Alliance are making a neat profit on the deal.

Early this afternoon, Mr. Burbark, who was in a much happier frame of mind, informed me that a certain other valley nearby which had hitherto been arid now had a stream flowing through it and should be excellent land for agricultural purposes. This valley, he said, was known as Painted Gulch.

He was quite surprised to know that I owned a hundred acres in Painted Gulch, which I had purchased from Mr. Quackenbush, and I have just completed a deal with Mr. Burbark whereby for the 100 acres I received five thousand dollars cash and the ownership of the excavating equipment now under water, and for which, incidentally, he gave me a check to send to you. The check is enclosed herewith, and you may send me my commission on the sale by return mail as I expect to keep my five thousand clear as capital to finance a certain project I have in mind, and to use the commission to raise the shovels, dragline and bulldozers from under water and repair them.

Again our connection, Mr. Itch, has proven mutually profitable and I know that you will regret that my other plans prevent me from returning immediately to your employ as salesman. However, my project intimately concerns excavating, so I will want your further help, and as soon as I have my plans worked out a bit better, I will write to you again.

Cordially yours,
William Z. Williams

• *"A fertile rice-farm in the very country to which you export rice!"*

RIP RAP For Imperial Dam

Stringfellow Brothers use 1¾-yard shovel and two ⅜-yard shovels in handling nearly 1,000,000 yards of rock and aggregate for dam, desilting plant, and dikes.

By JOS. C. COYLE

WITH numerous contractors and sub-contractors active, and about 2000 men employed, construction of the All-American Canal, the Imperial Dam and desilting plant at its head, and the Gila Valley gravity canal with headworks at the Arizona end of the dam, has gone forward rapidly during the fall and winter. The dam itself is 2,990 feet long, exclusive of a rock fill 470 feet long on the Arizona end. Abutments reach bedrock, but gate structures at each end of the dam rest largely on reinforced concrete bearing piles. The hollow, reinforced concrete, overflow section will be 1,200 feet long and 31 feet high, partly filled with gravel and strengthened inside by buttresses 2 feet thick.

It will rest on the river sand and silt, with a gravel-filled drainage trench beneath it, equipped with automatic ejectors, to expel seepage. A reinforced concrete paving slab extends upstream 212 feet from the dam, with three rows of sheet piling driven beneath it. Another row is driven at the lower edge of a concrete apron extending 65 feet downstream from the spillway. Below this, 150 feet of the streambed will be paved with selected boulders, from 3 feet to 6 feet in diameter.

Stringfellow Job

36,000 cubic yards of these big stones are included in the 200,000 cubic yards of rip-rap stone subcontracted by Stringfellow Brothers, of Los Angeles, and are being stored, as they are quarried, near the Arizona abutment. The firm quarries, hauls and places the rock. It also loads and hauls 250,000 cubic yards of processed aggregates for the dam and desilting plant, loads 300,000 cubic yards of the same for canal structures, and will furnish 170,000 cubic yards of rock fill for dikes. Production and placing of the rock paving is one of the more spectacular features in construction of the desilting plant—which is many times the largest ever constructed.

The quarry, near the Arizona end of the dam, is in volcanic granite, of varying solidity, and is excavated in three 20-foot lifts. It is drilled with Ingersoll-Rand S-49 jackhammers, using Crusca steel and Timken bits, on centers ranging from 8 to 14 feet, according to the nature of the rock at different points. As much as 6000 cubic yards is broken at a time. Halifax explosives are used, springing the holes twice and us-

• One of the jobs on which Stringfellow Brothers use this Bucyrus-Erie 10-B is handling rock in skips which are loaded by hand. One of the latter is being loaded at the right, while the 10-B is dumping a full one. Three-yard Chevrolet trucks are hauling rock from stone-yard to job.

ing from a minimum of five sticks the first time to as much as thirty sticks at the second chambering. After blowing out the holes with air they are loaded with "free-flow" bag powder and tamped with a wooden rod. An average of about ¾ pound of explosives per cubic yard has been required.

Separating Waste and Good Rocks

The paving stones must be not less than a foot thick, and not too large to place by hand. The problem at the quarry was to separate as much waste as possible from the workable stone, while loading. It was done by spotting a dump truck on each side of a 43-B Bucyrus-Erie shovel and loading waste material into one, good rock in the other. The former is hauled to a dump nearby and the rock to the stone yard, adjacent to the quarry, where it is dumped in windrows. Two White trucks, with 8-yard all-welded bath-tub bodies, are used for rock and one for waste. The shovel is equipped with a 2-cubic yard Amsco dipper.

After segregating the big boulders, suitable for spillway rip-rap, other large stones are split down to size by drilling with S-49 jackhammers and splitting with steel wedges and feathers. Cleavage must follow the grain of the rock, for satisfactory results, which necessitates a careful selection of jackhammer men. Compressed air, for both quarry and stone yard, is piped from an Ingersoll-Rand Imperial Type 40 stationary compressor, midway between the two operations and driven by a 75 hp. Westinghouse motor.

A 75 hp. Caterpillar, with LeTourneau bulldozer attached, is

• *Top: A concrete apron extends 65 feet downstream from the dam, and for 150 feet below this, the streambed is being lined by Stringfellow with selected boulders 6 to 8 feet in diameter.*

• *Center: Canal structures are being lined with 300,000 yards of rock not less than one foot thick, and not too large to be placed by hand. This view shows one lining crew in action.*

• *Bottom: Ingersoll-Rand jackhammers are used to drill the volcanic granite at the quarry, which is excavated in three 20-foot lifts.*

used in cleaning up waste about the stone yard. The usable rock is loaded by hand into three all-welded steel skips, of ½ inch plate and holding 1½ yards. These are open on one side, each of the other sides having a hook of 1½ inch round steel, welded vertically to the outside. Two are for hooking the lifting sling and one at the back for dumping. The latter hook is made with a pig-tail curl. The point is straight up, which speeds up hooking on the ring of the dumping chain. The skips are handled with a 10-B Bucyrus-Erie shovel, with crane attachment. Chevrolet 3-yard dump trucks haul the stone to the job.

World's Largest Desilting Plant

The desilting plant, which will remove the heavier silt that has heretofore settled on sides and bottom of irrigation channels and involved costly dredging operations, will consist of six basins. Each is 268 feet wide, 769 feet long and 14 feet deep. They are arranged in pairs, with an influent channel from the headworks serving each pair, and a fourth channel conveying water around the basins to the outlet channel. Seventy-two 125 foot Dorr clarifiers, rotating four times an hour around their concrete pedestals, will scrape the accumulated silt into sludge pipes leading through underground concrete galleries to a sluiceway reaching 3000 feet downstream from the dam and emptying into the river.

The sluiceway and other channels of the desilting plant will be lined with 18 inches of dry rock, and the inside slopes of compacted fills surrounding the basins will be rip-rapped in the same way. Some trimming with hammers is required in fitting the stones at the job, where from 500 to 600 cubic yards per day is placed by hand, on an 8 inch blanket of selected pit run-gravel. About 80,000 cubic yards of this gravel will be required. Excavation and hauling of gravel from a borrow pit near the job, is done at times when one of the firm's two 10-B shovels is available from the other work. With two 8-yard White trucks and four 3-yard Chevrolets hauling from this pit, as much as 120 yards per hour is sometimes loaded out with the ⅜-yard shovel.

• *Top: Sheepsfoot rollers like the one shown at the right compact the fill at Imperial Dam. Leveling is handled with harrow and bulldozer rigs as shown in the center. In the background is one of the dam contractor's big concrete plants.*

• *Bottom: Rock at the quarry is loaded by a Bucyrus-Erie 43-B. In order to separate waste material from usable rock, a truck is spotted on each side of the shovel. Good rock goes into one; waste into the other.*

Washed sand and four sizes of aggregate, up to 1½ inch rock are produced for both dam and canal at the plant of the Triangle Sand & Gravel Company and Charles Holmes, two miles from the dam, under a separate contract from the government. Moving on sectional wooden ramps, trucks store this material in stock piles some 50 feet high and 1000 feet long. From four to five of Stringfellow's trucks haul from these stock piles to the two big mixing plants used for Pumpcrete at the dam. To facilitate moving of the 10-B shovel to the right pile, the ratio of aggregates is computed according to the pouring to be done on each shift, and the machine spotted accordingly from time to time.

Eleven Passes in a Minute

As many as eighteen trucks, carrying up to 12½ cubic yards, are loaded with the Stringfellow machine when other fleets, hauling to contractors of structures along the canal, are active. According to the operator on one of the three shifts, he has filled a 4.2 yard truck in less than one minute. This required 11 passes with the ⅜-yard dipper. He explains that he broke in on the little shovel, and so had less trouble in becoming accustomed to its speedy movements than operators trained on large machines.

141 men are employed by Stringfellows, with 66 of them placing rock in the desilting works. Two shifts are worked, except on the aggregate which requires three. The nature of the job led to extensive use of common labor, recruited from the local relief roles at El Centro, California. Men are promoted from laborers to the better paying jobs as they show skill in the work. Stringfellow Brothers have long been active in building construction at Los Angeles, but purchased the three shovels used on this job upon starting the present contract. The two ⅜-yard machines are new, but the 43-B saw previous service with Morrison-Knudson on a railroad job at Bakersfield, California. Sixteen trucks are in use by the firm, of which 7 are 8-yard Whites and the remainder 3-yard Chevrolets. A repair shop is maintained on the job.

• Top: Stringfellow Brothers are loading and hauling about 250,000 yards of aggregates for the dam. Here, the second of their 10-B machines, equipped with ⅜-yard shovel front end, is loading pea gravel.

• Bottom: After big spillway boulders are separated, remaining rock quarried is split down to correct size for canal lining, with cleavage following the grain of the rock.

M.U.W. Company Has Main Contract

The Morrison - Utah - Winston Company—an affiliation of Morrison-Knudson, Boise, Idaho; the Utah Construction Company, Ogden, Utah; and Winston Brothers, Minneapolis—is general contractor for the dam and desilting plant, on a bid of $4,374,240. The work is under supervision of Roy B. Williams, construction engineer for the United States Bureau of Reclamation, at Yuma. A. T. Clark is office engineer, and J. C. Thrailkill chief clerk. John K. Rohrer is resident engineer in charge at the dam and desilting plant, assisted by Don M. Forrester.

Song for the Unsung Pitman

By Bob Belt

Those people who loiter 'round the works
Wherever shovels dig,
Lawyers, loafers, ribbon clerks,
Figures small and big,
Encourage the operator on
To even more endeavor
And murmur, when the dirt is gone,
"Gee, ain't that fellow clever?"
Some "Oh" and "Ah", some really shout,
Some only look, and sit—
And nobody gives a damn about
The greaser in the pit.

The operator takes the praise
As only what is due.
He loads a pair of ten-yard drays
And takes another chew.
Then to the crowd he grins a grin
And waves, and takes a bow.
A pair of empties coming in
Demand his service now.
He waves again, then swings about,
And spits himself a spit—
And he wouldn't be worth a damn without
The greaser in the pit.

L'envoi

Next time you watch a diggin' crew,
Please wave a friendly mitt
And shout a word of greeting to
The greaser in the pit.

EXCAVATING

FOUNDED 1906

A Hanson Publication

Devoted to the Excavating Industry

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

F. O. WYSE
Manager

ARNOLD ANDREWS
Editor

D. B. REED, JR.
Associate Editor

JOHN I. MORAVEC
Art Director

RALPH H. DEIHL
Assistant Editor

E. M. HEUSTON
Advertising Manager

Cutting Diversion's "Profit"

There never has been any profit in diversion—but there's even less now.

One-third of Maryland's share of this year's Federal-Aid funds have been forfeited because that state has spent some $4,000,000 of highway funds for general purposes. The Bureau of Public Roads is now investigating expenditures of highway revenues in other states to determine where other penalties are to be applied.

This action, taken under authority of the Hayden-Cartwright Act of 1934 puts real teeth in the anti-diversion sentiment which has been growing year by year—even as diversion itself has been growing.

A recent news release of the American Road Builders' Association points out that the 28,000,000 motor vehicles in the United States, if packed bumper to bumper, would jam a nine-lane, 8,600-mile highway extending completely around the United States. Further, the release states, if all the highway funds diverted in the last five years could be gathered, just such a nine-lane, 8,600-mile super-highway could be built with them. There can be no doubt that diversion has reached a menacing total. And unfortunately, state legislatures have shown that there can be no doubt that diversion will continue unless it is made so obviously unprofitable that the public refuses to countenance it—or unless it is made illegal.

Diversion is illegal in four states, and eight more are now considering anti-diversion legislation. But this remedy takes time. Constant effort on the part of all individuals and organizations interested in an adequate highway system is necessary to counteract the work of those to whom the highway revenues are a luscious temptation. For this reason, there is particular reason to rejoice at the enforcement of the penalty clause of the Hayden-Cartwright Act. Loss of one-third of regular federal aid is a stiff enough penalty to make any state legislature think twice before continuing and increasing the raids on funds motorists have willingly contributed for the sole purpose of building and maintaining the highways they use.

Maryland's governor has already advocated immediate cancellation of all diversion, and urged the legislature to restore to the highways all money diverted in the past.

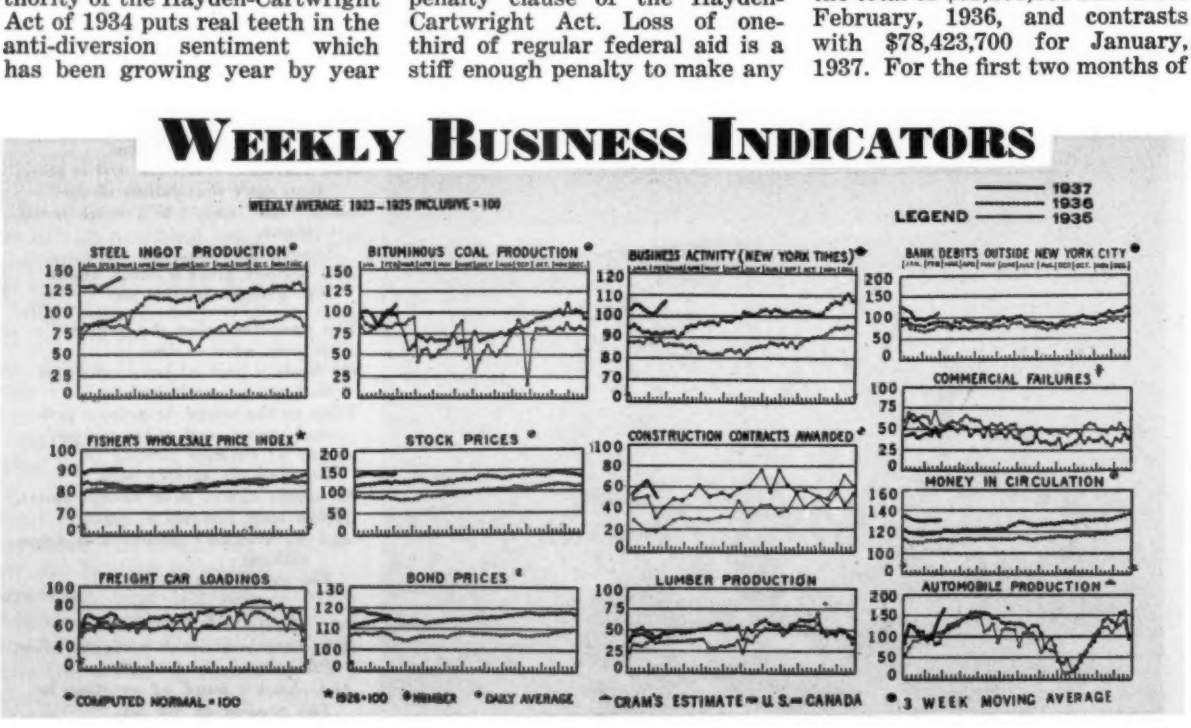
It is a good sign!

Construction Still Goes Up!

Construction work started in February showed a total about one-third greater than was reported in February, 1936, according to figures from F. W. Dodge Corporation. Reporting on the February results this agency indicated a total of $188,590,800 for February in the 37 Eastern States as compared with $140,419,100 for February of last year and $242,844,000 for January of this year. For the initial two months of 1937 the figure amounted to $431,434,800, a gain of about 22 per cent over the corresponding two-month total of $355,211,900 for 1936.

The February, 1937, figures included $63,011,700 for residential building; this was more than twice the total of $31,175,500 shown for February, 1936, and contrasts with $78,423,700 for January, 1937. For the first two months of

WEEKLY BUSINESS INDICATORS


WEEKLY AVERAGE 1923–1925 INCLUSIVE = 100
LEGEND 1937 1936 1935
STEEL INGOT PRODUCTION *
BITUMINOUS COAL PRODUCTION *
BUSINESS ACTIVITY (NEW YORK TIMES) *
BANK DEBITS OUTSIDE NEW YORK CITY *
COMMERCIAL FAILURES ‡
FISHER'S WHOLESALE PRICE INDEX ★
STOCK PRICES *
CONSTRUCTION CONTRACTS AWARDED *
MONEY IN CIRCULATION *
FREIGHT CAR LOADINGS
BOND PRICES *
LUMBER PRODUCTION
AUTOMOBILE PRODUCTION ^
* COMPUTED NORMAL = 100
★ 1926 = 100 ‡ NUMBER * DAILY AVERAGE
^ CRAM'S ESTIMATE — U.S. — CANADA
* 3 WEEK MOVING AVERAGE

1937 residential building amounted to $141,435,400, or a gain of about 105 per cent over the total of $68,615,000 for the first two months of 1936.

Non-residential building started in the 37 Eastern States during the first two months of 1937 amounted to $161,920,200 as against $153,090,700 for the corresponding two months of 1936.

Public Works and Utilities started during the first two months of 1937 in the 37 Eastern States totaled $128,079,200 as against $133,506,200 for the corresponding two months of 1936; the decline from last year in this division of the construction industry is entirely due to the slowing-up of the PWA program.

H. A. Light

Hubert A. Light, coal operator of Scranton, Pennsylvania, died recently following an illness of several weeks. Known as "Rube" to his many friends, Mr. Light was well known and liked in the soft coal industry. His passing means the loss of a fellow worker and friend to a large part of that industry.

He had lived in Scranton for seven years, coming to that city from Ohio, and Michigan, his birth state. He is survived by his widow and five sisters.

Harry Helt

The recent death from pneumonia of Harry Helt, assistant manager of the Bucyrus-Erie Chicago office, came as a shock to his many friends and coworkers in the excavating field.

Mr. Helt came with Bucyrus-Erie after extensive field experience, and in his subsequent activities for that company grew well acquainted with dirt movers in the middle west, and with their problems.

He is survived by his widow, three sisters, and his parents.

Who Was the Boss?

Where excavating equipment is leased, with or without the services of employees, and injury to an employee occurs in the course of use of the equipment under the lease, question is apt to spring up as to who is the employer of the injured man, for the purpose of workmen's compensation liability.

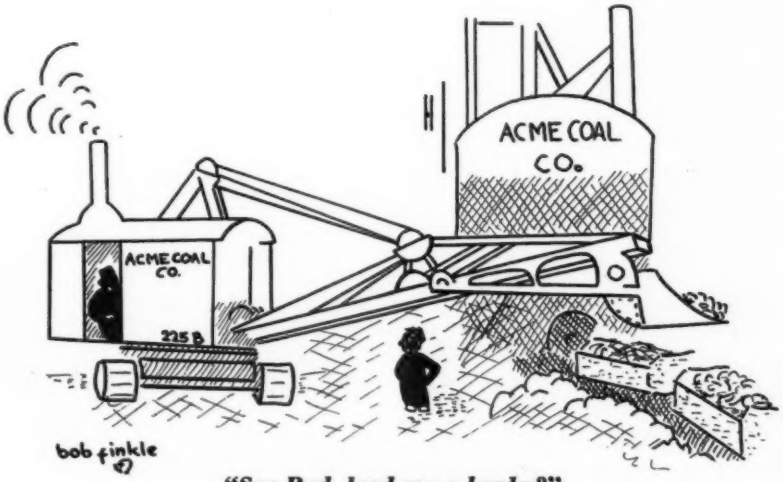
As pointed out by the Pennsylvania Superior Court in the case of Laymon v. Herwick, 184 Atl. 557, the decisive test in such cases is who is in *control* of the excavating operations.

A steam shovel owner leased it to a contractor, agreeing to secure an operator and a fireman, who were to be paid by the contractor. Laymon was hired as fireman and was assisting the owner in moving the shovel to the place where it was to be used, when he was injured through getting his hand caught in the gears.

Deciding that the injured man had a valid claim against the contractor for compensation under the Pennsylvania Workmen's Compensation Act, the court noted that the steam shovel was under the control of the contractor at the time of the accident. It made no difference, the court said, that the injury occurred before the shovel reached the place where it was to be used.

The opinion cites, in support of the decision rendered, the case of Lobos v. Union Paving Co., 148 Atl. 500, where the Pennsylvania Supreme Court decided several years ago that where a shovel operator who had been hired to a lessee with a shovel was injured while riding on a truck which was transporting the shovel to the site on which it was to be used in excavating, the lessee was properly regarded as the employer for compensation liability purposes.

Arthur L. H. Street,
Attorney at Law.



"Say Bud, lend me a hanky?"

Thoughts for Executives

"Every man in business will have a hard road to go, and he will have to find its turnings, but he need not go in the dark, if he will take with him the light of other men's experience."

So stated John Wanamaker, one of the greatest of all merchants. The light of his own experience has guided many other merchants to outstanding success.

Today's business man has a score of aids with which to chart the path of his own business ship. Each monthly issue of each business journal gives him new facts, informs him of how other men are sucessfully handling the very tasks that he finds difficult. The daily press and radio do their part in spreading the story of how to live our business lives.

And around every executive there are scores of his friends who have built their own success upon the selfsame principle. The man who thinks himself "too big" to be guided by the light of other men's experience invariably wishes he had done so.

John Wanamaker built one of the most successful businesses in the world because during every day of his business life he kept his eyes open to the light of other business men about him. And shared his success with those selfsame business men.

Not only should today's business man take advantage of this light of the other man's experience but he also must be willing to present his own light so that others may follow in his footsteps.

—Ernest W. Fair.

EQUIPMENT
You Ought to Know About

Bucyrus-Erie Four Wheel Scraper

Bucyrus-Erie Company, South Milwaukee, Wisconsin, manufacturers of excavating, drilling, and material handling equipment announce a new four wheel scraper for the excavating field.

Using a three point suspension, and with ample clearance to swivel the front wheels under the frame, this scraper can be maneuvered in short, sharp turns, making a complete circle within the radius of its own length. Because all four wheels are inside the path of the cutting edge, it digs full width in close quarters, and cuts right up against the bank or other obstructions. The dumping action is simple, fast, and positive. The bowl backs away and tilts forward sharply, while the apron tips and slides ahead—both to an almost perpendicular position.

A "double-curve" cutting edge is constructed to deliver a combined shearing cut and scooping action. The dirt boils up inside the bowl, funneling up into a full heaping load. In spreading, the Scraper blade is used to level off the dump, resulting in an even, accurate spread of the dirt. Even when the Scraper is working in wet ground, damp clay, or heavy gumbo, the loading, dumping, and spreading is performed easily and cleanly.

Of simple, strong construction, the box-welded frame which carries the unit resists both tortional and tensile stresses set up in scraper operation. Welded plates of high-tensile strength alloy steel, form the bowl and the apron. The replaceable cutting edge of high-carbon manganese steel, is supported on a rigid, heat-treated, steel casting, welded into the bowl.

The Bucyrus-Erie 4-wheel Scraper is regulated by an easy-running, single cable operating over a minimum number of sheaves from the drum power unit on the tractor. One control lever, conveniently placed, gives the operator instant and positive control of his loading, hauling, dumping, and spreading operations. The cable control is so efficient and the cutting action so easy and smooth, that a 40 H. P. tractor can easily load and heap the 4½ yard, struck-measure scraper in ordinary material. An extra long cable is supplied, with the surplus footage coiled at the rear of the scraper. In case of wear or breakage, the amount needed for replacement is easily fed into the hoist from this coil.

The Bucyrus-Erie 4-wheel Scraper is manufactured in two sizes, 4½ yard capacity and 7 yard capacity level measure. A detailed and well illustrated bulletin is available upon request. Write to Bucyrus-Erie Company.

Won-Way Truck Body

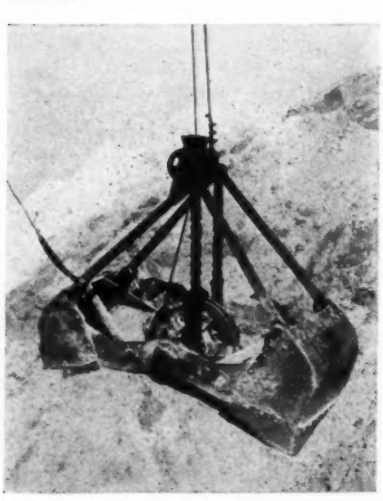
A Won-Way truck body by the Easton Car & Construction Company, Easton, Pennsylvania, is now available to the quarry industry. This body is constructed to withstand the shocks of power shovel loading and transportation of heavy rock loads. It is built of

heavy high-carbon steel plate reinforced with many section H-beam side stakes, floor supports, and lengthwise H-Beam sills. The body end-plate is heavily braced and extends up over the truck cab for driver protection. The body is elevated for dumping by means of a double telescope hydraulic hoist located on the truck chassis. Body capacity is 8 cubic yards (waterlevel) overall width 110″, inside length 138″, inside depth 29″, weight of body and hoist 12,190 lbs.

Hayward Clam Shell Bucket

The Hayward Company, 50 Church Street, New York, have just brought out a new clam shell bucket, known as the "Class E-16."

Many features are to be found in this new model. It is lighter in weight, yet said to be stronger—a feature made possible by the use of modern alloys. Cutting edges are wide and streamlined for easier digging. Shells are one-piece, without rivets, and are designed for smooth penetration and quick discharge. The closing mechanism is a genuine Hayward power-wheel.



Concrete Bucket

A new type of all-welded cylindrical concrete bucket, particularly designed for convenience in operation in close forms and for handling low slump concrete, has been perfected by the Dravo Corporation, Pittsburgh, Pennsylvania. The bucket, made in two, three, and four yard capacities, is a bottom dump controllable type. It has no projecting levers and is operated entirely by a hand wheel set into the outer shell of the buckets. The design provides a safety feature in that there are no projecting parts to catch on forms, reinforcing steel, or clothing of men operating the bucket. In operation, it was found that the

method of mounting the control gate was such as to make the bucket self-closing, and it can be closed readily when only part of the concrete has been poured. The operating mechanism, which might become clogged with concrete, is protected by shields. Lubrication is practically the only attention required.

Onan Generating Plants

D. W. Onan and Sons, 43 Royalston Avenue, Minneapolis, Minnesota, are announcing new models of alternating current generating plants in sizes 350 to 1000 watts.

These models are of streamline, fully enclosed, dymmetrical design; are small, compact and operate on gasoline generating alternating current electricity.

Among the new features are:

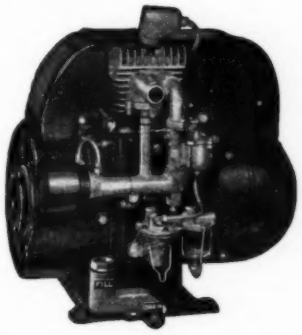
Arrangements for servicing the plant entirely from the exhaust side enabling installation in close quarters;

Welded all steel generator with special cooling;

Ball type outboard bearings;

Starting with thermal control;

Standard accessories the same as used on Motor Car Engines.



The plants operate portable radio transmitters, X-ray, clinic and public address equipment.

Automatic Locking Nut

The American Nut Company, Incorporated, Lebanon, Pennsylvania, has devised a nut that automatically locks itself and stays locked until removed with a wrench. It is put on a bolt the ordinary way and will not work loose because of a locking pin which travels between the threads of the bolt and automatically impinges itself against the bolt at a fixed angle. The impingement acts as a ratchet moving up and taking a new bite as the nut is drawn tighter.

This nut when used with the American Nut Company's "Structural Rib Bolt" is claimed to be a practical substitute for riveting.

International Harvester Trucks

Of special interest to truck users is the recent announcement that International Harvester has an entirely new line of motor trucks ranging in capacity from light delivery units to the largest six-wheeler. These new models include conventional four-wheel units, six-wheelers with both dual-drive and trailing axles, and cab-over-engine types. The complete International line consists of 26 models in 77 wheelbases with gross vehicle weights ranging from 4,400 to 62,000 pounds.

These new Internationals provide universally standardized (S.-A.E.) cab-to-rear-axle dimensionsions and permit mounting of standard length bodies of stock sizes. Front axles are set back, and this, together with the relocation of rear axles and cabs, contributes to greatly improved load distribution, not only of body and payload but of gross weight.

Severe hill-climbing, brake, and transmission tests were included in the strenuous development program carried on by International Harvester prior to the production of this line of motor trucks. This illustration shows three trucks of the big fleet operated for several weeks on difficult mountain roads in the vicinity of Chattanooga, Tenn. This is the famous "W" route up Signal Mountain. Extremely sharp curves and steep grades made this road especially suitable for climbing ability tests.

Not in the Contract

Joe: "I can't eat this soup."

Waiter: "Sorry, I'll call the manager."

Joe (to manager): "—this soup, I can't eat it."

Manager: "I'll take care of it at once. Call the chef."

Joe (to chef): "I can't eat this soup."

Chef: "What's the matter with it?"

Joe: "Nothing, only I ain't got a spoon."

The shortest possible unit of time is the difference between the moment the traffic light changes and when the boob behind you honks for you to go.

Operator: "I got in trouble with the boss this morning."

Oiler: "How come?"

Operator: "He said that all questions could be answered by yes or no, and asked if any one could give him one that couldn't. I asked him if he had stopped beating his wife."

A man in an insane asylum sat fishing over a flower-bed. A visitor wishing to be friendly walked up and said, "How many have you caught today?"

"You're the ninth," replied the nut.

A party of excavating men on a trip to England were being shown over a cathedral by a guide.

"Behind the altar," he told them, lies Richard the Second. In the churchyard outside lies Mary Queen of Scots; also Henry the Eighth. And who," he demanded, halting above an unmarked flagstone, "who do you think is a-lying 'ere?"

"Well," answered one contractor, 'I don't know for sure, but I have my suspicions."

Oh, George, let's don't park here.
" " " " "
" " " "
" " "
" "
"

• *"Yeah, his girl accepted him last night"*

"I want to see some kid gloves for my daughter."

"Yes, madam, white kid?"

"Sir!"

Newspaper Item—"Mrs. Lottie Prim was granted a divorce when she testified that since she and her husband were married he had spoken to her but three times. She was awarded custody of their three children."

She: "Do you approve of tight skirts?"

He: "No. I think women should let the liquor alone."

Mrs. Newly-Rich said: "I clean my diamonds with ammonia, my rubies with Bordeaux wine, my emeralds with Danzig brandy, and my sapphires with fresh milk."

"Is that so?" said her companion, "When mine get dirty, I just throw them away."

Here's to the greatest gambler of all time—Lady Godiva. She put everything she had on a horse.

Two lady schoolteachers from Brooklyn, spending their sabbatical year exploring western Canada, stopped at a small and old-fashioned hotel in Alberta recently.

One of the pair was inclined to be worrisome when traveling, and she couldn't rest until she had made a tour of the corridors to hunt out exits in case of fire. The first door she opened, unfortunately, turned out to be that of the public bath, occupied by an elderly gentleman taking a shower.

"Oh, excuse me!" the lady stammered, flustered. "I'm looking for the fire escape." Then she ran for it.

To her dismay, she hadn't got far along the corridor when she heard a shout behind her and, looking around, saw the gentleman, wearing only a towel, running after her. "Where's the fire?" he hollered.

...NOW...
the
"Sunshine Process"
(ADDITION OF VITAMIN D)
makes good
Bread and Milk
BETTER

now...
the Preforming Process
makes good Wire Rope *BETTER*

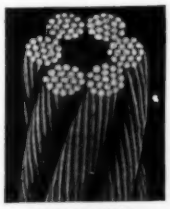
● The addition of Vitamin D concentrate gives food the life-giving value of sunshine. A basic improvement to an age-old product.

Preforming gives wire rope the life-giving value of relaxation. A basic improvement to a century-old product.

Preforming relaxes wire rope. It puts all component wires and strands in a state of ease. They are comfortable, unstrained, flexible. Preforming thereby tends to eliminate the destructive internal torsional stress, tends to reduce crankiness and kinkiness.

Preforming makes wire rope easier to handle, easier and faster to splice or socket. For many applications preformed wire rope lasts longer, gives better service.

Ask us to send you a sample. Learn all the facts about its true superiority. For many wire rope applications, preformed wire rope will give you much greater dollar value.



PREFORMED

NON-PREFORMED

LICENSEES UNDER PREFORMED WIRE ROPE PATENTS
Educational Bureau • 520 North Michigan Avenue • Chicago, Illinois

***Preformed* WIRE ROPE**
for SAFETY · ECONOMY · EFFICIENCY

For your convenience in writing to Licensees Under Preformed Wire Rope Patents, you will find a card bound in this issue.

Field Notes

What Price "Minimum Depth" Requirement in Excavating Contract?

Concededly, in certain classes of construction work that involves excavation, the depth of the latter for the purpose intended may depend upon the nature of the sub-soil, contour of the ground, or other features. A minimum depth requirement may then be inserted in the contract to take care of any uncertainties that may arise thereby.

However, such a requirement where unrestricted, and its application left entirely to the judgment of the owner, may quite easily result in a hard bargain from the contractor's standpoint. Here is a point well worth the having in mind by earthworks contractors in general, and, as an illustration of judicial construction of a contract of this kind, the following recently decided case may be reviewed with profit.

Excavation Contract Provided for "Minimum Depth"

In this case the plaintiff contractor agreed to dig and back fill a ditch or trench 18 or more miles in length for 96 cents per lineal foot. The trench was to carry a 20-inch high pressure gas line through a rough and hilly country, and its depth would naturally vary with the contour of the ground and because of overbends and sag bends. In respect to its depth and width, the contract provides:

"The contractor hereby agrees and undertakes, subject to competent inspection hereinafter described; to dig and excavate a ditch or trench to a minimum depth of four feet, a uniform width of twenty-six inches; * * * all work to be performed * * * according to the provisions of this agreement, and the maps and specifications hereto attached and made a part thereof."

The pertinent part of the specifications provided:

"The depth shall not be less than 48" on level ground and even slopes. Wherever bends are required the depth of the ditch shall be increased to a depth acceptable to the first party's [defendant's] inspector or Superintendent. Where sag bends are used, the depth of the ditch may be reduced to a minimum of 36" at the discretion of the first party's inspector or Superintendent. * * * All of this work shall be subject to approval of first party's inspector or Superintendent."

Upon completion of the work, it was ascertained that the trench averaged a depth of 4 feet 11 inches. The plaintiff contractor was paid according to the contract, i.e., 96 cents per lineal foot, and then brought the instant action for extra work not covered by the contract.

This action was based upon the contention that the contract requirement for a minimum depth of 4 feet meant an average depth of 4 feet. Consequently, since the average depth was 4 feet 11 inches, this 11 inches should be classified as extra work.

The defendant, on the other hand, took the position that the contract meant just what it said. In other words, that it called for a minimum depth of 4 feet, but that, with the purpose of the trench in mind, when a greater depth was required it was covered.

The trial court, however, submitted the question raised to a jury and the latter awarded plaintiff a verdict for work performed in excess of the contract. From judgment on this, the defendant appealed, and the higher court in construing this contract and in reversing the judgment, among other things, said:

The Language of the Court

"A provision that a trench shall have a minimum depth of 4 feet appears to us quite clear. Performance cannot be based, unl s otherwise permitted, upon a trench that is anywhere less than 4 feet. This does not, of course, mean that the trench must be uniformly 4 feet in depth, because, if that were so, the term 'uniform' would have been used, as it was used in the agreement in respect to the width of the trench, or the word 'minimum' would have been eliminated. * * *

"Not only does the contract clearly provide for a minimum depth of the trench subject to that requirement being waived * * *, but it also includes a maximum requirement, for the specifications provide that, wherever bends are required, the depth of the ditch shall be increased (over 48") to a depth acceptable to the

(*Continued on page 226*)

● *In drilling, or reaming holes in large sheets of metal a great deal of time may be saved by attaching the "old man" holder post to one end of a section of scrap eye beam, beneath which a dolly is attached (in this case a track roller from a tractor). Sufficient weight is added by placing scrap in a large can on the beam. It is moved by a handle of old pipe, welded to the rear end, and rests on a projection of scrap metal near the handle.*

NSTANT STARTING..
OW MAINTENANCE

Controlled Ignition **OIL TRACTORS**

Field Notes

(*Continued from page 222*)

first party's inspector or superintendent.

"There is nothing unusual about this sort of provision in a construction contract, and nothing in the provision that renders the contract indefinite or uncertain, for, where extent of performance is left to either party's discretion or approval, such discretion or approval must be reasonably exercised, and there is no proof here that the maximum depth requirements at any stage of the work were either arbitrary or unreasonable, or not necessitated by topography. * * *

"Since in our view the contract is plain in its term, and does not require construction, it is clear that all of the work done by the contractor came within the purview of the agreement, and was fully paid for according to its terms. The motion for a directed verdict should have been granted. * * * "

In conclusion the court said:

"Judgment reversed, and cause remanded for further proceedings consistent herewith, without prejudice to the right of plaintiff to submit proof of unreasonable or arbitrary requirements by the defendant in the performance of the contract involved."

In the light of the facts and holding of the foregoing case, it is obvious that an excavating contractor may well watch his p's and q's in subscribing to a minimum depth provision with the maximum left entirely to the discretion of the other party. Doubtless, here the plaintiff contractor believed that this provision meant an average minimum depth of 4 feet, hence its claim for the extra 11 inches it was required to excavate.

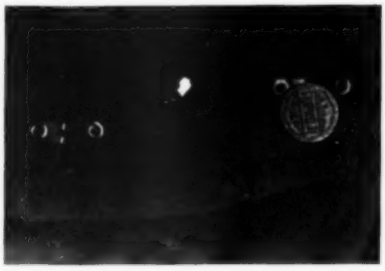
However, as we have seen, the court held the contract did not carry that meaning; that it meant just what it said. And, so long as the defendant acted in good faith, the maximum depth was whatever in its judgment the work required.

Leslie Childs.

Paper Fasteners Maintain Overall Button Holes

The center of the top and bottom of overall button holes is often badly worn by the metal button. This wear is, of course, hastened when heavy things are carried in the pockets as a matter of necessary routine of the job. Frequently wear goes unnoticed until even a reworking of the hole with thread is of but little use, the opening has become too large. The button thus slips out easily.

When a bit of wear is noticed, put two ordinary brass paper fasteners on the center of the top and bottom of the hole as shown in the picture. Use the fasteners having a small hole through one of the halves for the sharp clinch point on the other section. Get the bottom of the inside of the clip up against the edge of the hole and clinch firmly by means of



heavy flat nose pliers or tapping together with a small hammer.

The friction and wear of the edge of the button is taken by the face of the fasteners when the garment is buttoned up. They do not bother when in the laundry in any way, the button is easily fastened and pressed out with the fingers, but will not come out until wanted. The holes will outlast the rest of the garment.

—Frank W. Bentley, Jr.

Emergency Bushing Quickly Made

When standard bushings are unavailable and you are in urgent need of one or more, there usually is a way in which to make an emergency bushing that will serve temporarily. This is one of the advantages of mechanical drive.

Babbitt and lead often lend themselves to an occasion of this kind better than anything else.

To apply babbitt or lead bushing, all that is necessary is to support the pulley in any convenient way so that it is in its correct position around the shaft. That is, it must be concentric. Then by means of putty or any

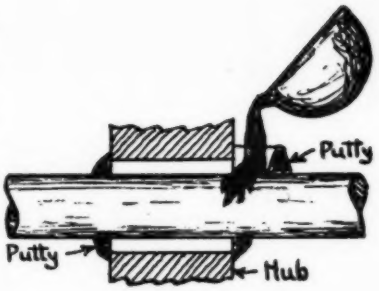


Fig. 1

other suitable material build dams around the openings and arrange the mould so that the metal can be poured. The method is so obvious that detailed explanation is unnecessary. Then pour the metal about as indicated in Fig. 1. That's all there is to it.

For split pulleys, if it so happens that the bushing must be exactly one eighth of an inch thick, or a quarter inch, and if you have in stock some round iron rods an eighth or quarter inch in diameter, cut the rods to a length slightly greater than the length of the pulley hub. Then use the rods for bushings placed side by side to fill the entire space between the shaft and pulley as shown in Fig. 2.

Square stock is better than round stock for this purpose because the round pieces will act like rollers in a roller bearing if the pulley is not bolted up sufficiently tight to prevent such motion. For this reason rough round pieces are better than smooth. Use square or rectangular stock in preference to the round if you have it.

Sometimes the quickest way is to use strips of hardwood laid side by side around the interior of the pulley just as explained above for the rods. Wood is more easily reduced to the proper size than metal. Where there is ample contact surface between the pulley and shaft wood generally serves the purpose just as well as metal.

W. F. Schaphorst, M.E.

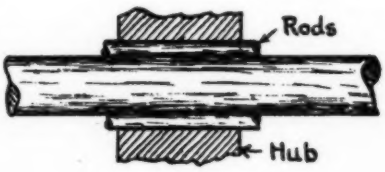


Fig. 2

BUCYRUS-MONIGHAN

gets closer to the water's edge and works more securely under these conditions than other machines with other types of traction. It turns around in the most restricted spaces without digging itself in. Manufactured by Bucyrus-Monighan Company, Chicago, Illinois.

On the North Platte River Project in Nebraska, 7 Bucyrus-Monighans demonstrate ability to produce big yardage on this type of work. This 6160 belonging to Martin-Day Co., carries an 8-yard bucket.

BUCYRUS MONIGHAN

Sold by BUCYRUS-ERIE CO.
SOUTH MILWAUKEE, WISCONSIN, U.S.A.

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

SHOTS
from the Firing Line

Dredging On the Rand

RAND MINES, LIMITED, developed a very interesting scheme for the dredging of the Booysens Spruit Dam, in Africa.

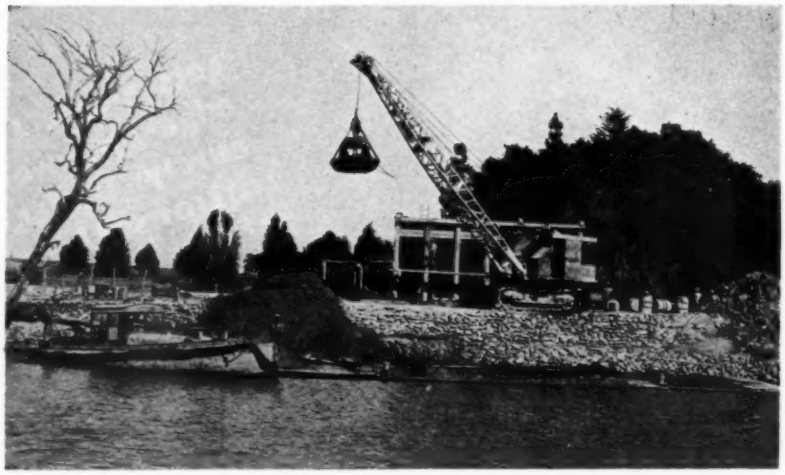
Boysens Spruit Dam is the main reservoir for the water supply for all the gold mines controlled by Rand Mines Limited. The water conservation area is in the region of one hundred acres and was originally 30 to 35 ft. deep. During the passing of years, however, the waste washed into the reservoir from the surrounding districts caused much silt to settle. In addition, slimes and other deposits from the surrounding dumps were blown in by the strong winds and washed down by the heavy rains until the water capacity of the dam decreased to such an extent that the position became acute. The capacity of the reservoir had decreased to 23,000,000 cu. ft., the greatest depth being only 14 feet.

Steps were taken, therefore, to devise some scheme whereby the silt could be rapidly and economically removed in order to preserve the original water storage capacity.

The material to be excavated consisted of heavy black clay and silt; not easy stuff to handle. Various schemes were considered, including hydraulic and dipper dredging plants, but the method finally recommended by one of Ruston-Bucyrus Engineers and decided upon by the Consulting Engineer to the Rand Mines Limited, was that of excavating the silt by means of clamshell excavators.

The equipment installed comprised one Ruston-Bucyrus 37-B diesel clamshell dredge, with 35-ft. boom and 1½-yard bucket; one Ruston-Bucyrus 37-B diesel clamshell, with caterpillar-type mounting, 50-foot boom and 1¼-yard bucket; one diesel tug of 64 b.h.p and three 80-ton hopper (60 cu. yd.) barges. The tug and barges were made by Messrs. J. S. Watson (Gainsborough) Ltd., of Gainsborough, England. The complete outfit was supplied by Messrs. Hubert Davies & Co., Ltd. of Johannesburg, South Africa, who are sole representatives in South Africa and Rhodesia for Ruston-Bucyrus Ltd., of Lincoln, England.

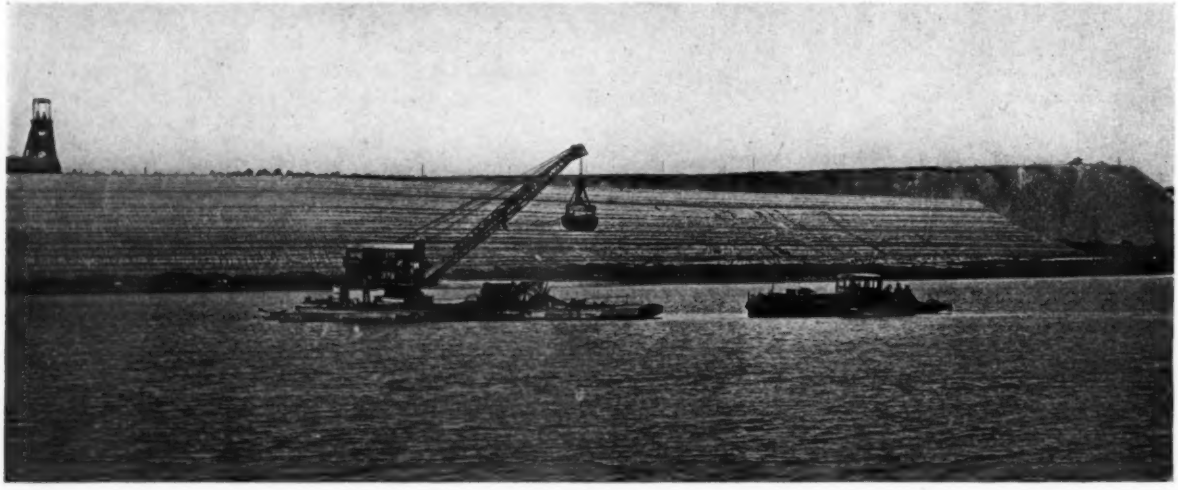
The method of operation adopted was for the clamshell dredge to dig and elevate the silt, from a maximum depth of 35 feet below water level, and to discharge it into the hopper barges. The fully-loaded barges were then towed by the diesel tug to alongside the dam wall, where the caterpillar mounted clamshell, located on the top of the dam wall, would empty the barges and dump the silt over the wall, where a limited dump area was available.



• *The Ruston-Bucyrus 37-B clamshell dredge shown below excavates silt from the reservoir and loads it to three 80-ton hopper barges.*

• *Silt taken from the reservoir is unloaded from barges by a second 37-B clamshell, which builds a temporary spoil pile, later loaded out to one-yard dump trucks.*

Later, when this dump area was filled, the caterpillar clamshell would move from the wall to the foreshore, where it would discharge the silt through a hopper bin into 1 cu. yd. dump trucks which would transport the



THE ONLY BOOK OF ITS KIND!

The thirtieth edition of PIT AND QUARRY HANDBOOK is now off the press. Packed within its 828 pages is a wealth of technical and practical information you should have instantly on hand for ready reference. Look over the list of chapter headings below.

Prospecting and Evaluating Pit and Quarry Lands
Plant Design
Hydraulicking and Dredging
The Dry Removal of Loose Overburden from Deposits
Drilling
Blasting
Water Pumping
Excavating and Loading
Intraplant Transportation
Crushing, Grinding and Air Separating
Elevating and Conveying
Screening, Classifying and Washing
Drying
Slurry Pumping and Filtration
Storage and Reclamation
Burning and Cooling
Waste-Heat Recovery
The Hydration of Lime
Dust Collection
Packing and Loading for Shipment
Electrical Equipment
Internal-Combustion Engines
Power Transmission
Portable Aggregate Plants
Premixed Bituminized Aggregates
Stabilized Road Materials
Ready-Mixed Concrete and Lime Putty
Lubrication
Welding, Cutting and Hard-Facing
Statistics
Directory of Cement, Gypsum, Lime, Sand, Gravel and Crushed-Stone Plants
Trade and Technical Organizations
Equipment Catalogue Index and Buyers' Guide
Equipment Manufacturers' Trade Names

PIT AND QUARRY HANDBOOK is prepared annually by the publishers of PIT AND QUARRY . . . the leading monthly journal of the nonmetallic-minerals industries. If you are not already a subscriber, take advantage of the combination offer contained in the coupon below.

Pit and Quarry Publications
Room 907, Rand-McNally Bldg.
Chicago, Ill.

Please send me the 1937 edition of PIT AND QUARRY HANDBOOK ($10.00 per copy) ..... ☐

Send me the HANDBOOK and PIT AND QUARRY each month for one year ($10.50 for both) ..... ☐

Check Inclosed ☐ Send Invoice ☐

Name..... Title.....

Company.....

Address..... City and State.....

When writing to Pit and Quarry Publications, please use coupon or card bound in this issue.

silt on to the adjoining flats where it would be dumped.

During the first six months, two shifts per day were worked, after which one shift per day was worked for about 7 months. During this period of nearly 13 months, 245,740 cu. yds. of silt were removed from the reservoir, thereby increasing the water capacity by 41,775,800 gallons. The intention of the Engineers is to continue dredging until approximately 1,000,000 cubic yards of silt has been removed, giving an ultimate reservoir capacity of about 193,000,000 gallons.

The average cost of dredging during the period mentioned was 9.5c per cubic yard or 58c per 1000 gallons gain in capacity. The figure includes the operating and maintenance costs of the clamshell dredge, caterpillar-type clamshell, diesel tug and three hopper barges, hopper bin and 1 cu. yd. dump trucks and the salaries and wages of operators and crews, but does not include charges for depreciation and interest on the plant.

In comparing the cost per cubic yard with similar costs in this country, it should be remembered that the delivered price of diesel fuel on the Rand is approximately $57.50 per short ton, and other costs are relatively high.

Spring Speeds Work at Grand Coulee

By Grace Kirkpatrick

With the heavy snows and the severe cold of February and January ended, MWAK, contractor for the Grand Coulee dam, is fast adding to its payroll and work is beginning to speed up again on the big project. Excavation is under way in the midchannel of the river between block 40, to which the midstream cofferdams are anchored, and the east pit. As the overburden in this section is disappearing, the steel trestles from which the concrete is being poured are being extended from the west cliff, farther and farther into the river area.

● *A view of cast bank operations at Grand Coulee, where MWAK are speeding up work with the approach of Spring.*

Engineers say that it will not be necessary to wait until all of the bedrock is exposed before concrete is poured, and jackhammer and cleanup crews will be started as soon as an appreciable area is uncovered.

The contractor is also busy strengthening the cross-streams cofferdams to withstand the flow of the Columbia which will increase steadily until high water is reached in the early summer, when it will flow in a huge volume and with terrific force. A fleet of trucks is busy hauling dirt and filling in on the upstream barrier of the upstream face.

All of the sheet piling is in place and the crib work back of the steel wall is reported nearly complete. Much of the cribbing has been filled with earth and rocks, only the top tiers of cribbing remaining to be filled.

As a constant protection against water seepage, pumps are kept going 24 hours a day. However, because the clay in which the cofferdams are built is extremely close-grained, water has difficulty in getting through, even though the steel piling is some distance from

(*Continued on page 234*)

● *Building Glacier Lake Dam, the highest in America, at Glacier Lake, Montana. S. J. Groves & Sons ⅝-yard shovel loaded about 250 cubic yards of this rock per day when not slowed down by secondary shooting.*

ROCK

Rock-bottom cost!

19 CENTS AN HOUR FOR HAULING 28-YD. LOADS

On road construction near Hagerstown, Md., "Caterpillar" Diesel RD8 Tractors haul Athey wagons in tandem, cutting rock-hauling costs to a new low. Fuel costs less than 19 cents an hour—and lubrication costs are proportionately low.

On tunnel, dam, canal or road construction, the lowest rock and dirt moving costs are produced by heavy-duty "Caterpillar" Diesel Tractors—teamed with the type of wagons or scrapers best suited to the material handled and the ground conditions encountered.

The tractors' big power permits hauling tandem loads when conditions are good—and if the going gets tough, the second wagon is dropped and the work goes on without interruption, even when other equipment is hung up.

20,000 hours of service prove that "Caterpillar" Diesels carry their low-cost records through a long life. There's a dealer near you—he can tell you how costs on your job can be lowered.

TRACTOR CO.
PEORIA, ILLINOIS

WORLD'S LARGEST MANUFACTURER OF DIESEL ENGINES, TRACK-TYPE TRACTORS AND ROAD MACHINERY

Shots from the Firing Line

(*Continued from page 230*)

bedrock. For this reason seepage is negligible.

The belt conveyor system as it is now set up recently reached its high mark of moving 28,000 cubic yards in 21 hours. This is, of course, far below the record set by the west bank conveyor, which at the high point of its operation handled more than 50,000 yards in a day. However, the present conveyor is working in "muck" that is said to be very unwielding, and the amount handled, considering this, is very satisfactory, indeed.

With the advent of warmer weather and the melting of much snow, the now famous ice dam proved its efficiency by holding back a small slide which moved a distance. The mass continued to move steadily down until it struck the big ice barrier. Stopped at that point, it did little damage.

Erosion Control to Protect Highways

Erosion control measures developed for farm lands will be used to protect sections of state and federal-aid highways this year under plans now being worked out between 19 state highway departments, the Bureau of Public Roads and the Soil Conservation Service, the U. S. Department of Agriculture recently announced.

A survey in Wisconsin showed erosion responsible for much of the cost of highway maintenance in certain parts of that state. Uncontrolled soil erosion also increases maintenance costs on federal-aid roads, according to officials of the Bureau of Public Roads.

Under the proposed program, state and federal officials will select short stretches of right-of-way along highways within the boundaries of Soil Conservation Service areas. The Service will furnish technical supervision, labor and necessary planting materials. The state will supply construction material and equipment, and agree to maintain the work for five years.

Actual operations to protect highway cuts and fills, highway ditches, and drainage structures, have been started in some of the 19 states, says H. H. Bennett, Chief of the Soil Conservation Service. Vegetative control measures will be used wherever possible, although some construction work will be done where gullies are menacing adjacent farm lands.

States that have established roadside erosion control relationships with the Soil Conservation Service are: Alabama, Arizona, Arkansas, Georgia, Idaho, Illinois, Indiana, Maryland, Mississippi, North Carolina, Ohio, Oregon, South Carolina, Texas, Utah, Virginia, Washington, West Virginia, and Wisconsin.

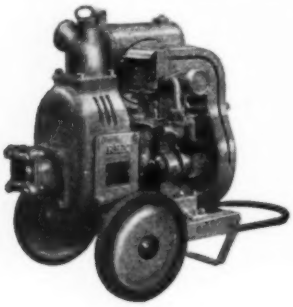
Mineral Industries Safety Awards

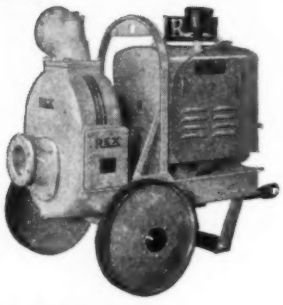
Outstanding acts of heroism on the part of 15 employees of the mineral and allied industries in the rescue or attempted rescue of fellow workers in times of stress and peril were recognized by the bestowal of medals by the Joseph A. Holmes Safety Association at its annual meeting held in Washington, D. C. Notable records made by 69 mining companies or other organizations in extraordinary safety achievement were recognized by the award of certificates of honor. Ten certificates of honor were given to individuals for noteworthy safety records. The Joseph A. Holmes Safety Association, named in honor of the first director of the United States Bureau of Mines, Department of the Interior, is closely affiliated with that Bureau.

In his annual report to the Association, President J. W. Finch, Director of the Bureau of Mines, called attention to the excellent safety record of the mining industry in the past several years, the record for the past four or five years having constituted the best safety performance in the history of mining in the United States. Awards of the Association, he said, continued to exert a helpful influence in the attainment of this safety record. The awards evidenced that mines are becoming safer working places and that those engaged in the mineral industries have displayed the highest attributes of mental alertness and physical courage which are necessary when emergency arises.

MOST GALLONS PER DOLLAR!

HERE'S NEW PUMPING ECONOMY!





REX SPEED PRIME PUMPS

THE COMPLETE LINE —

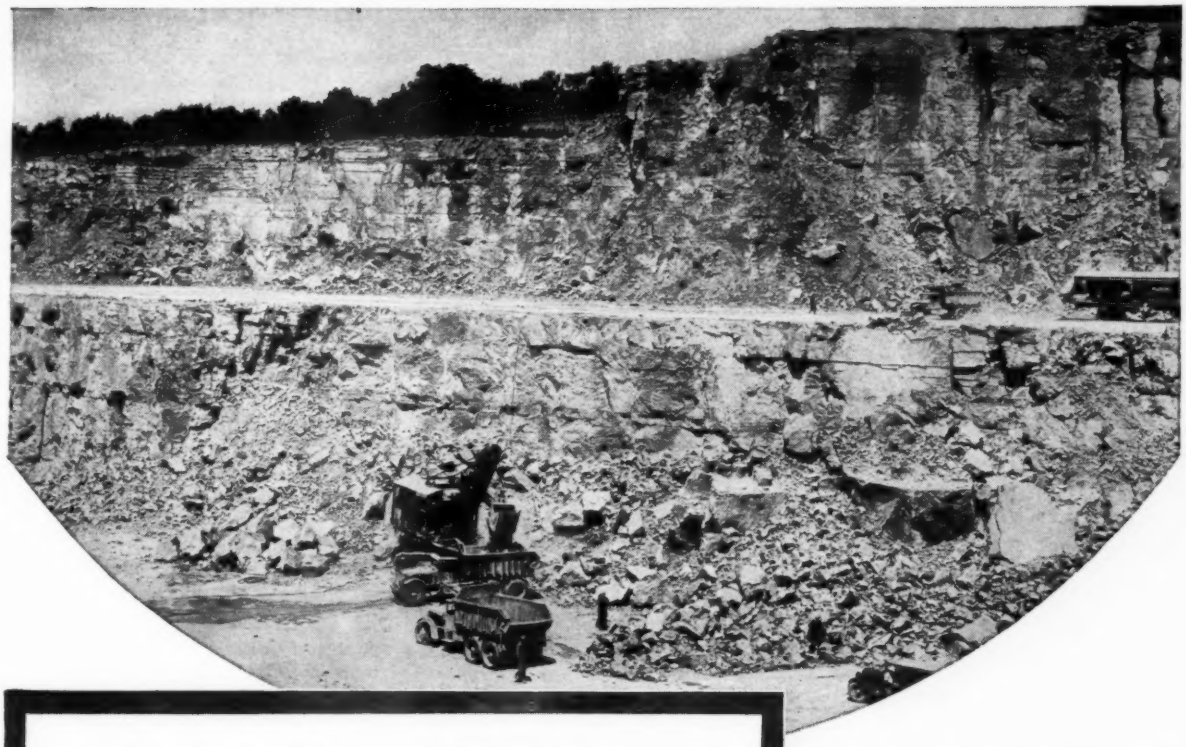
A new high in de-watering economy is reached by the positive, dependable operation of these new Rex Speed Prime Pumps . . . They have the new Rex Prime Control Valve that makes priming completely automatic and gives positive recirculation cut-off . . . The Patented Rex "Peeler" that insures greater air-handling ability. They are *foolproof* in every sense of the word. There are sizes to meet the needs of any job no matter what the gallonage—from the little 2″-7M to the big capacity 8″-125M . . . You have no water worries when you're working with Rex!

Send for our 1937 Rex Speed Prime Pump Bulletin!

CHAIN BELTCOMPANY 1652 W. Bruce St., Milwaukee, Wis.

REX CHAIN BELT COMPANY of MILWAUKEE Speed Prime Pumps

For your convenience in writing to Chain Belt Company, you will find a card bound in this issue.



Portion of quarries, Marquette Cement Mfg. Co., Cape Girardeau, Mo.

SPECIFY CORDEAU *for Lower Operating Costs*

A large cement producer in the Middle West, the Marquette Cement Mfg. Company, specifies Cordeau-Bickford Detonating Fuse for efficient blasting. Large shots are made at the Cape Girardeau, Mo., plant, a section of which is shown in the photograph above.

Blasting economy is realized here because detonation with Cordeau permits planned split-second rotation—proper relief of burden. This results in better fragmentation—easier removal. Cordeau allows fewer and bigger shots because it connects all holes and detonates each charge with the force of a primer cartridge. Every pound of explosive used gives maximum power.

Cordeau-Bickford Detonating Fuse is insensitive to ordinary shocks, and must be detonated.

Cordeau-Bickford Detonating Fuse is manufactured with the same precision that has made Ensign-Bickford Safety Fuse famous for more than 100 years. Send for a copy of the Cordeau Book. It contains interesting important instructions and data.

CORDEAU-BICKFORD DETONATING FUSE

THE ENSIGN-BICKFORD COMPANY, SIMSBURY, CONN.

CB-60

MAKERS OF ENSIGN-BICKFORD SAFETY FUSE SINCE 1836

For your convenience in writing to The Ensign-Bickford Company, you will find a card bound in this issue.

RED ARCH
dragline buckets

Stronger
Lighter
Faster

RED ARCH dragline buckets are built for fast handling and long life. They are quick filling, clean dumping, correctly balanced. RED ARCH buckets are made of tough, light, heat-treated, alloy steels. Lips are extra strong, bottoms are reinforced, teeth are removable for sharpening or replacement. Available in three types . . . sizes from ⅜ to 14 yards. Write for bulletins. 905D

BUCYRUS ERIE

BUCYRUS-ERIE

EXCAVATING, DRILLING & MATERIAL HANDLING EQUIPMENT • • SOUTH MILWAUKEE, WIS.

Highway Bridge Award to Lewis-Chambers

Lewis-Chambers Construction Company of New Orleans, Louisiana, on its bid of $74,258, has been awarded the contract for construction of two reinforced concrete highway bridges across the All-American Canal.

Award of the contract covering clay sewer pipes for drainage along the All-American Canal also was announced. This contract was awarded to Gladding, McBean & Company of Los Angeles, California, on its offer of $70,223.12. This was the lowest of seven proposals received by the Bureau of Reclamation at its Denver office on January 22.

The successful bid for the bridges was the lowest of 16 received and opened by the Bureau of Reclamation at its Yuma, Arizona, office January 28.

The bridges will carry the main transcontinental highway across the canal at two points in the vicinity of the sand hills west of Yuma, Arizona.

New A. E. D. Officers

At its recent annual meeting, the Associated Equipment Dealers elected the following officers and directors for the ensuing year:

Officers: President, G. F. Lowe, Chicago, Ill.; first vice-president, A. F. Sersanous, Portland, Ore.; second vice-president, Victor L. Phillips, Kansas City, Mo.; secretary-treasurer, A. C. Blaisdell, Cincinnati, Ohio.

Directors: J. S. Gilman, Minneapolis, Minn.; E. K. Hurst, Sioux Falls, S. D.; E. S. Jenison, San Francisco, Calif.; H. W. Fletcher, New Orleans, La.; E. P. Phillips, Richmond, Va.

Birmingham Dam Reaches Half-Way Mark

By Geo. H. Watson

One of the largest earth and rock filled dams in the country is being built in connection with a $6,000,000 industrial water supply system for Birmingham, Ala. Over one million cubic yards of material will be required to build the dam which will be 185 feet high and 1,500 feet across.

The dam is being constructed on the Blackburn Fork of the Warrior River, 33 miles north of Birmingham, and when completed will create a reservoir of 22,000,000,000 gallons capacity, covering approximately 6,080 acres. Natural limestone formations, blasted from mountainside formations near the dam site and crushed by a plant on the premises, are being used in its construction.

Delivering the water from the reservoir created by the dam will be a 60-inch steel pipe line reaching to the city limits. In all there will be 44 miles of pipe including the city distribution system where cast iron pipe from 16 to 48 inches is used. Up to 44 million gallons of water per day will be delivered to a score or more of industries such as steel plants, blast furnaces and cement mills.

Pipe used on the job is being coated inside and out with Hermastic preservative, a patent application by the Wailes-Dove Hermiston Company.

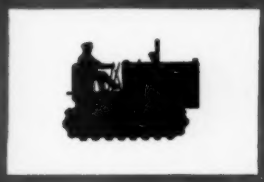
Located near the dam will be two 20,000,000-gallon pumps which will pump the water into a distribution reservoir of 65,000,000 gallons capacity. This storage reservoir is located near the city limits. It provides the advantage of having a supply of water near the demand, permits of intermittent pumping, provides a uniform gravity pressure and offers a safety factor in case of breakdown. The reservoir was constructed by building two earth dams between ridges.

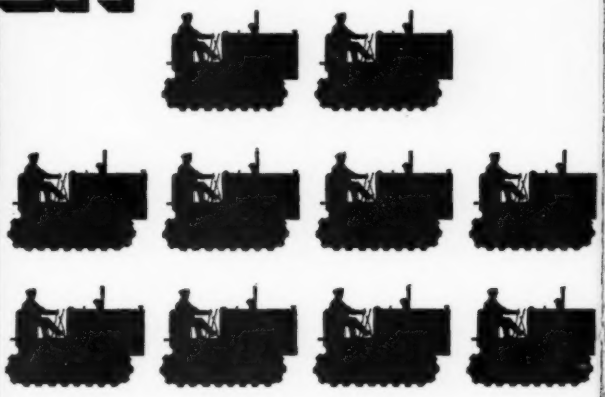
Construction of the industrial water supply, long needed and agitated by

• *Laying of the 60-inch pipe is shown in this photo. A WPA crew last September laid 3¼ sections of the pipe in one day, claiming the world championship for this type of work.*

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

Multiply Diesel Service Hours by TEN with SINCLAIR TEN-OL





How would you like to get ten times more service hours between shutdowns with your "Caterpillar" Diesel? You can if you use Sinclair Ten-ol, the new alloyed lubricating oil developed by Sinclair.

In full power comparative laboratory tests using "Caterpillar" Diesels, Sinclair Ten-ol was compared to the finest straight mineral oil. Ten-ol gave ten times more service hours without shutdown than the high grade straight mineral oil. In the average of all tests, consumption of Ten-ol was approximately one-half that of high grade straight mineral oils.

Sinclair Ten-ol is recommended by the Caterpillar Tractor Company as a "new outstanding Diesel engine lubricant." Order Sinclair Ten-ol, Sinclair Diesel fuel and other Sinclair products from the local Sinclair office or write to Sinclair Refining Company (Inc.), 630 Fifth Avenue, New York City.

Copyrighted, 1937, by Sinclair Refining Company (Inc.)

Unretouched photo of piston removed from a "Caterpillar" Diesel after an accelerated operation test with finest straight mineral oil. Note carbon-coated piston crown, sludge, plugged oil control rings and gum on piston skirt, and evidence of excessive blow-by, resulting from poor piston seal.

Unretouched photo of a piston removed from a "Caterpillar" Diesel after an accelerated operation test ten times as long *as the one on the left. Note absence of ring sticking, perfect condition of oil control rings. Freedom from blow-by indicates proper piston seal. Sinclair Ten-ol multiplies "Caterpillar" Diesel service hours between shutdowns by ten.*

Birmingham civic interests, was made possible by a $3,430,000 loan by the PWA and a $2,378,000 grant by the WPA.

Contract for the dam was awarded to the Walsh Construction Company of Davenport, Iowa, at a cost of $1,685,231. Contract for 66,000 feet of the 60-inch steel pipe was awarded to the Chicago Bridge & Iron Company and the Ingalls Iron Works and fabricated in Birmingham. Most of the pipe laying was done by relief labor, but part of the main pipe line was let to contract.

Birmingham is the largest city in the county, not being located on or near a lake, river, canal or other substantial body of water. All the water available for industrial use in Birmingham, some 125,000,000 gallons, had been developed, leaving none available for new industries, especially those using much water such as chemical plants, rayon mills and tire plants.

Many industries had been forced to provide their own water supply at much expense, including the Tennessee Coal Iron & Railroad Company, a U. S. Steel subsidiary, but most of them signed contracts for the city water, which will at least guarantee them a plenteous and ready reserve supply and will meet expansion needs.

At the request of the city health department, an alkalinity adjustment will be made in the industrial water to make it disagreeable to the taste, although harmless. The city at present has an ample supply of water for human consumption supplied by a private owned water works company.

The industrial water system will supply a metropolitan district of some 52 square miles and with 400,000 population. Future extension of the water to Bessemer, 12 miles away, is planned.

The engineering commission in charge of the construction of the water system is composed of Col. A. C. Polk, executive engineer; Harry Hendon, resident engineer; A. Clinton Decker, consulting engineer; O. G. Thurlow, consulting engineer; and J. D. Webb, Birmingham city engineer. WPA and PWA engineers are also lending assistance.

Construction is now about the halfway mark and is scheduled for completion early in 1938.

• *One of E. C. Hall's International trucks is shown here dumping rock for the sub-base of the Salmon River cut-off. A Jaeger spreader is working behind the truck.*

Oregon's Scenic Salmon River Cut-off in Final Stages

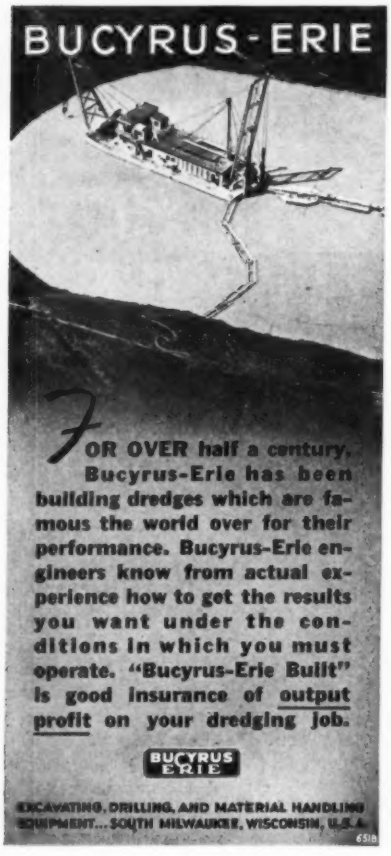
E. C. Hall, of Eugene, Oregon, had the contract last season for a $240,000 reconstruction surfacing and stockpiling project on the interesting new scenic Salmon River Highway, or Salmon River cut-off as it is frequently called.

In the fleet of eleven motor trucks utilized on the job were three 3½ to 7-ton, six-wheel, dual-drive, two-speed rear-axle, model CS-55-F Internationals equipped with 8-yard bodies, and four model CS-30, 1½-ton, two-speed, rear-axle Internationals. The CS-30's are equipped with 3-yard bodies.

The crushing and screening plant employed on this project was operated by four International Diesels, three PD-40's, and a 100-horsepower unit.

The Salmon River Highway is designated as Route 18 in the Oregon State Highway System. The 13.5 miles covered by E. C. Hall's contract is between Grand Ronde and Otis, where it connects with the famous new Oregon Coast Highway, which hugs the rugged coast line from border to border and which passes over six new large-sized bridges, including the Coos Bay bridge, which is 5,338 feet long and costs $2,215,000, and the Yaquina Bay bridge, which is 3,260 feet long and costs $1,235,000.

The Salmon River Highway provides the shortest route between Portland and the Tillamook County beaches at Neskowin, Oceanlake, Delake, Nelscott, and Newport served by the new coast highway; it is 28 miles shorter than the old route, hence the term Salmon River cut-


BUCYRUS-ERIE
FOR OVER half a century, Bucyrus-Erie has been building dredges which are famous the world over for their performance. Bucyrus-Erie engineers know from actual experience how to get the results you want under the conditions in which you must operate. "Bucyrus-Erie Built" is good insurance of output profit on your dredging job.
BUCYRUS ERIE
EXCAVATING, DRILLING, AND MATERIAL HANDLING EQUIPMENT... SOUTH MILWAUKEE, WISCONSIN, U.S.A.
651h

Bigger Payloads
"DXL" DRAGLINE BUCKET
Special alloy steel enables a LIGHTER yet STRONGER construction—freer handling and a saving of crane time.
WRITE FOR BULLETIN
The Wellman Engineering Co.
7002 CENTRAL AVE., CLEVELAND, OHIO

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

KOEHRING DUMPTOR

KOEHRING HEAVY DUTY

HEAVY DUTY

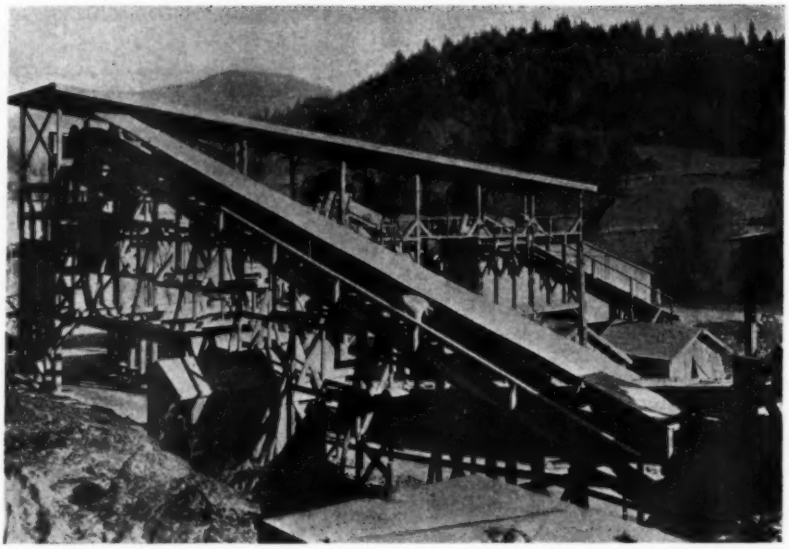
— construction of Koehring Dumptors withstands the abuse of continuous hard service under rough hauling conditions. *Full loads* of rock were easily loaded, speedily hauled, and quickly dumped on this tough rock excavation job.

KOEHRING COMPANY

Pavers · Mixers · Shovels · Cranes · Draglines · Dumptors · Mud-Jacks

3026 WEST CONCORDIA AVENUE, MILWAUKEE, WISCONSIN

For your convenience in writing to Koehring Company, you will find a card bound in this issue.



• Operating three 7-hour shifts daily, this International Diesel-powered plant crushed rock used on E. C. Hall's highway contract.

off. Construction has been financed with Forest Highway funds and has been under the immediate supervision of the Bureau of Public Roads, United States Department of Agriculture. It was financed thus because the section is included in the Oregon National Forest Highway system.

The Salmon River cut-off is a notable example of the stage-construction policy advocated by the Bureau of Public Roads. By this policy effort is first concentrated on getting a road quickly through and thus secure the benefits from the investment as soon as possible. To accomplish this, economies in initial construction are practiced, stuctures often are temporary, and surfacing frequently at first is of low type or in certain sections may be entirely omitted.

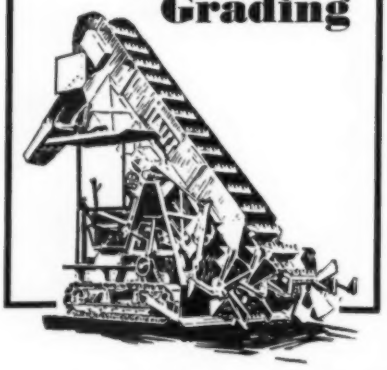
Thus, when the Salmon River cut-off was proposed, this stage-construction policy was adopted, and the first step, begun in 1927, was to build a graded dirt road of minimum width. The object of course was to get the road itself through as quickly as possible. In all the initial construction work, however, final alignments and grades were considered in the plans so that maximum salvage in the future construction stages could be obtained. In subsequent years surfacing and grading contracts were awarded. In September, 1935, the final step in the construction was started, all sections not previously built to ultimate standard were widened and all surface courses were laid over the old surfacing to provide a subbase 17 inches thick of water-bound macadam which is to support a 3½-inch bituminous plant-mix pavement. A contract for this pavement is to be let this coming season.

As stated above, the amount of E. C. Hall's contract for last season's work was $240,000 and the principal items covered by this contract were as follows: fine grading subgrade and shoulders 13.53 miles; special crushed rock bottom course, 90,000 tons; top course 20,000 tons; leveling course 7,000 tons salvage of surfacing 3,500 cubic yards and supplemental crushed rock 32,500 tons.

The subbase was built up in several layers as follows: first a bottom 6-inch layer of 3-inch rock; second a ¾-inch layer of ¾-inch key rock; third, another 6-inch layer of 3-inch rock; fourth, another layer of ¾-inch key rock; and finally a top layer of ¾-inch rock down to dust. Each layer of course was rolled, two 10-ton gas rollers being used. The finer layers were processed with water and blade and for this work two 10-foot blades and 2,900-gallon water tank were used. The 3-inch rock was hauled only in the six-wheel trucks and was spread evenly by means of a spreader box which was hitched to the rear of each truck when being spread, as shown in accompanying illustrations. Traffic was allowed to proceed over the section with very little inconvenience all the while this construction was in progress.

Rock for the subbase was crushed in the plant shown in an accompanying illustration which was located on the project, and rock was obtained from a quarry immediately adjoining. The plant was operated 21 hours a day with three 7-hour shifts. The output was 2,500 tons a day. The plant consisted of a 15x38-inch jaw crusher operated by one of the PD-40 Diesels, an 8-inch gyratory crusher operated by another of the PD-40 Diesels and the recrusher consisting of a set of 40x20-inch rollers which was operated by the 100-horsepower Diesel. The third PD-40 International Diesel power unit operated a 50-kilowatt generator, which provided power for driving by means of individual motors all conveyors and screens and a compressor, and operating a complete lighting system.

Shallow Grading



. . . is a job for Haiss Excavator. Continuous digging — no turntable swing. From a skimming pass to a 30" depth. 8' wide at one pass. All manganese wearing parts.

Let us quote . . . see how little you pay for 2 yds. a min. capacity.

WRITE WIRE OR TELEPHONE

HAISS

George Haiss Mfg. Co., Inc., 144th St. & Park Ave., New York

Who, for over 40 years, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Bucket Loaders — Clamshell Buckets

Pick Up Profits

THERE is money in rock handling if you use a modern, fast, reliable Bucyrus-Erie Rock Grab. Simple, safe and easy to operate, this unit obsoletes customary dog and chain or sling methods. Five sizes are available — 2½, 5, 10, 15 and 20 ton capacities. Write for complete information to take advantage of bigger rock handling profits.

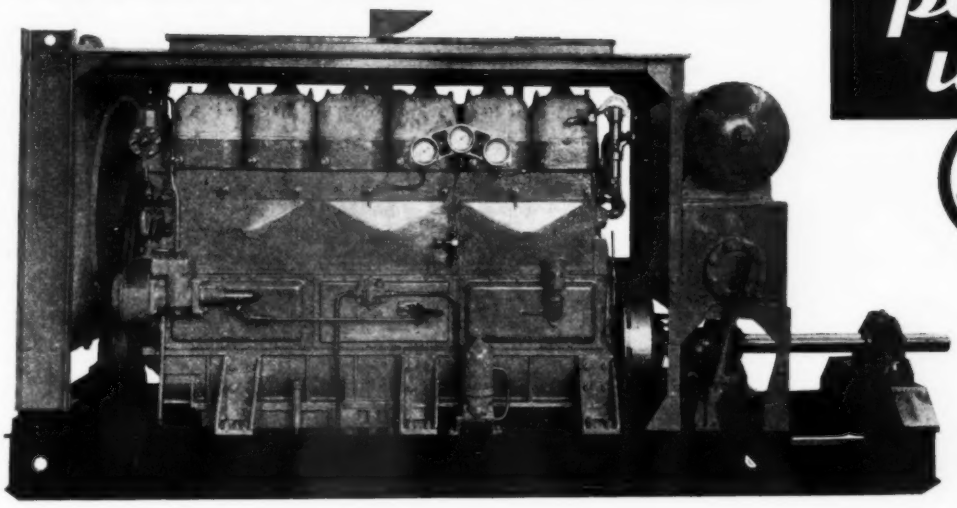
922

BUCYRUS-ERIE

EXCAVATING, DRILLING & MATERIAL-HANDLING EQUIPMENT • • SOUTH MILWAUKEE, WIS.

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

OREGON ROAD BUILDER *pleased with Atlas Diesel power unit*



This is the 6 cylinder 120 H.P. Atlas Diesel Power Unit used by Mr. A. S. Wallace of Roseburg, Oregon.

"In six months running, I haven't had a moment's delay with the Atlas Diesel power unit. When I need more equipment, I'll be back to see you."

That was the terse report of A. S. Wallace of Roseburg, Oregon when asked about the performance of a 6 cylinder 7" x 8½", 120 H.P. Atlas Diesel power unit he has been using to pull three crushers, an elevator and a couple of screens.

Continuous operation is important to every contractor. The quicker a job is finished, the greater the profit, and the sooner another job can be started. Delays are expensive.

Power your rock crusher or excavator with an Atlas Diesel, designed especially for heavy duty service, and you'll be sure to complete your jobs in jig time, with the lowest possible power cost.

The pictures above show the Wallace rock crushing plant operating on Green Spring Mountain at an altitude of 3500 feet.

ATLAS IMPERIAL DIESEL ENGINE CO.

Oakland, California Mattoon, Illinois

ATLAS IMPERIAL

For your convenience in writing to Atlas Imperial Diesel Engine Co., you will find a card bound in this issue.

Aqueduct Completion Month

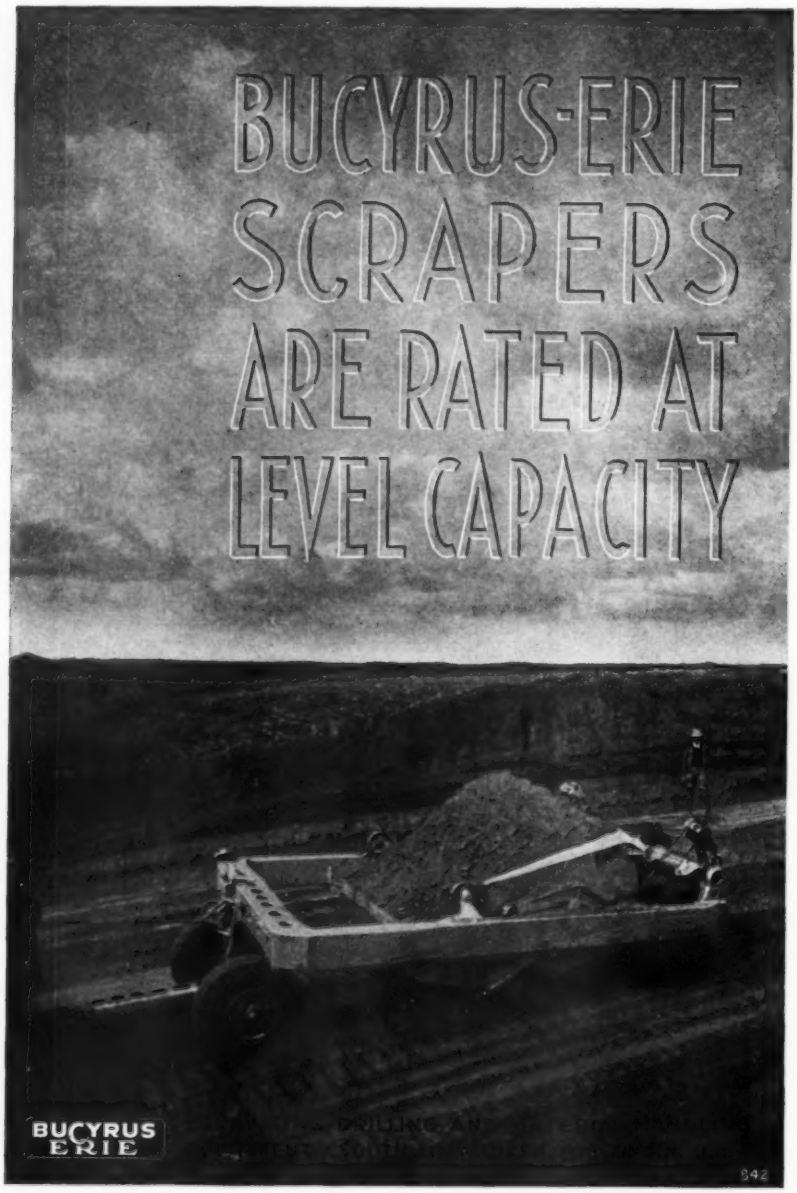
By Kay Campbell

March saw a great number of the schedules on the Colorado River Aqueduct reaching completion. Monrovia No. 3, the longest tunnel on the distribution system (32,105 feet in length) was holed through by West Construction Company. This tunnel, which will have an inside diameter of 10 feet when lined, was started in March, 1935, and already concreting has been started from the east portal working west. The tunnel, which is through hard rock all the way and from which water in excess of 1,500 gallons per minute was pumped during the drilling process, was excavated from three different headings, West Portal, Fish Canyon Adit and the East Portal. More than 5,640 feet has been lined.

Along the main aqueduct the arch lining has been poured in all of the contract tunnels with Winston Brothers who were working on Coxcomb tunnel bringing that phase of their concreting to a finish last month. And now only the East Coachellas being worked by the Force Account remains to be poured, with the exception of, of course, the San Jacinto Tunnel. In the East Coachellas 2,000 feet of arch remains to be poured; and that portion of the San Jacinto which lies between Potrero and West Portal has been completed as well as 1,046 feet between the East Portal and Cabazon shaft.

Lining of the 17,700 foot Pasadena tunnel was finished about the middle of March by Dixon, Bent Brothers and Johnson. Monrovia No. 4 (8,133 feet long) was holed through about the same time. Lining was completed on the San Rafael No. 1 by the same company last month. This tunnel, which is located in three district cities, Glendale, Los Angeles, and Pasadena, is 4,047 feet in length.

With the exception of pumping plants and San Jacinto tunnel it is expected by the directors that everything will be washed up along the main line of the aqueduct this summer. Work will be started at that time on Gene Wash and Copper Basin Dams.



New St. Lawrence Bridge

By Henry W. Unger

Bids have been received for the construction of a new international highway bridge, which will span the St. Lawrence River near Wells Island, below Kingston, Ontario. The bridge will be named the Thousand Islands Bridge.

Three distinct structures, the American, Canadian, and International rift crossings, will comprise the bridge.

A high level bridge of the suspension type, with a 22-foot concrete roadway and two sidewalks, 800-foot main span, two 350-foot side spans and approximately 3,000 feet of viaduct constitutes the American crossing.

A high level bridge of the suspension type, with 22-foot concrete roadway and two sidewalks, 750-foot main span, two 300-foot side spans and about 2,100 feet of viaduct, constitute the Canadian crossing. A 300-foot plate girder arch and a 600-foot truss span on three piers is included in the viaduct. The main tower pier on the south side of this crossing, is to be found in water at a maximum ledge rock foundation depth of approximately 20 feet. All other piers will be found in shallow water. A 22-foot roadway, together with two sidewalks, each 2½ feet wide, are combined with the structure.

Robinson & Stienman, of New York, are the U. S. engineers in charge, and Monsarrat & Pratley, of Montreal, Canada, will represent the Canadian interests.

Completion of the bridge is expected in two years, with construction expected to start in April, since the plans and specifications have been approved of by the War Department of the U. S. and the Public Works Department of the Dominion of Canada.

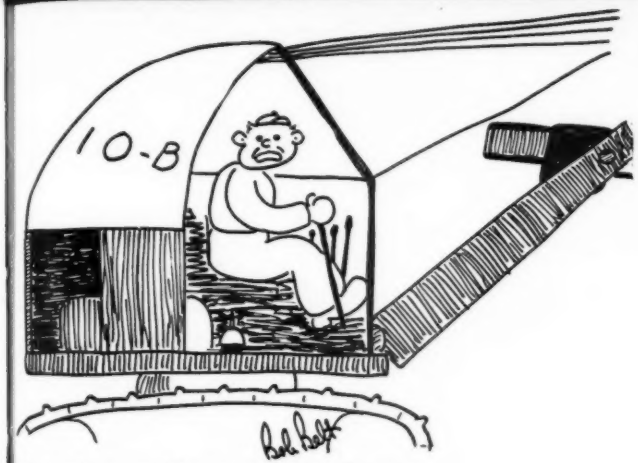
An approximate sum of $2,500,000 will take care of the cost of the bridge.

Puffed Wheat for Highways

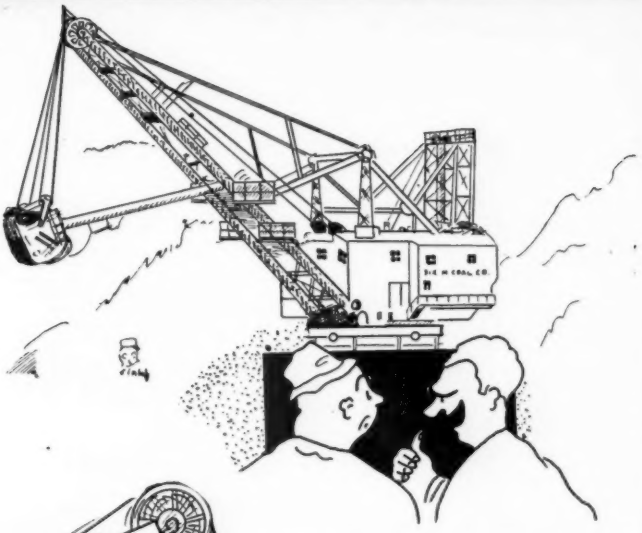
TO PREVENT the bumps created by bulging of material in expansion joints of concrete highways, the Parabond Company of Cambridge, Mass., has introduced a new material. Parabond, as described in Time, is a rubber latex compound containing a strong adhesive mixture to provide adherence to the concrete. Puffed wheat is thickly interlarded to eliminate bulging, as it permits the compound to give under temperature changes without forming a ridge across the road.

For your convenience in writing to Bucyrus-Erie, you will find a card bound in this issue.

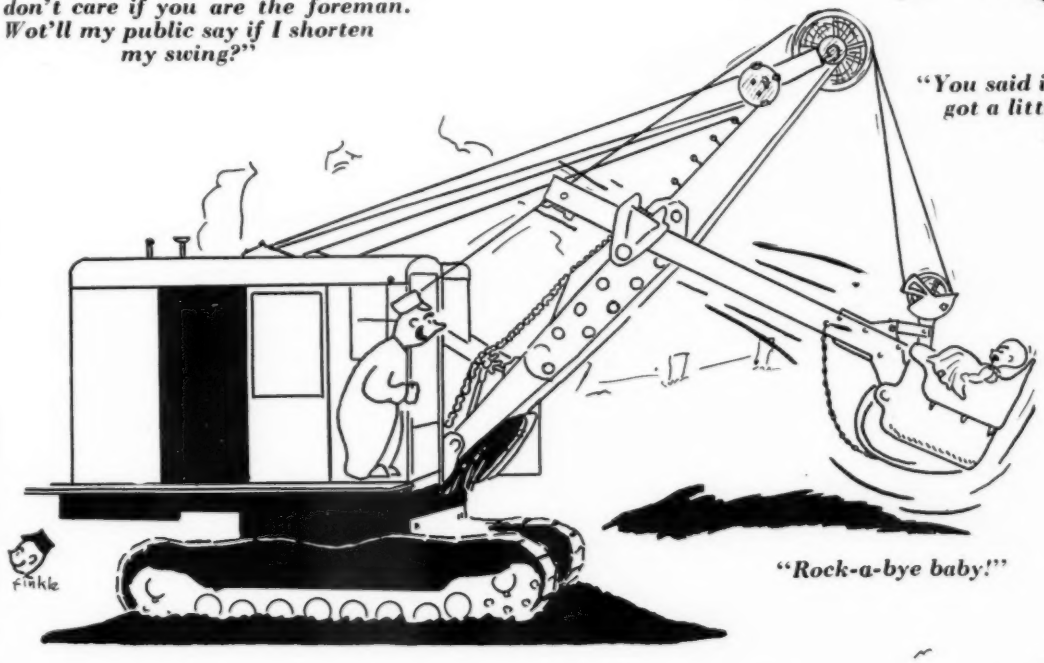
EX-LAFF 2



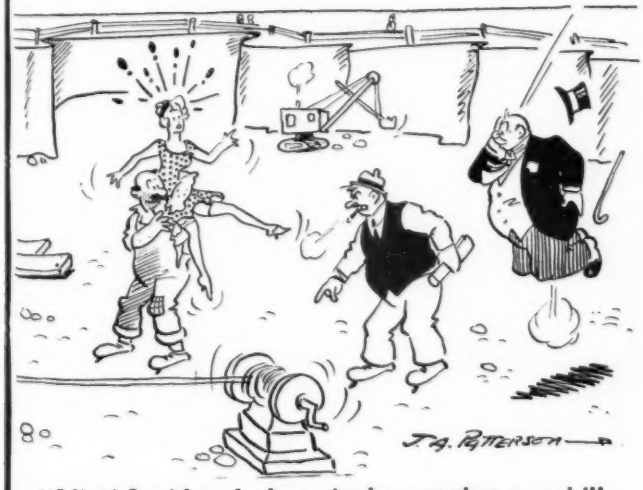
"I don't care if you are the foreman. Wot'll my public say if I shorten my swing?"



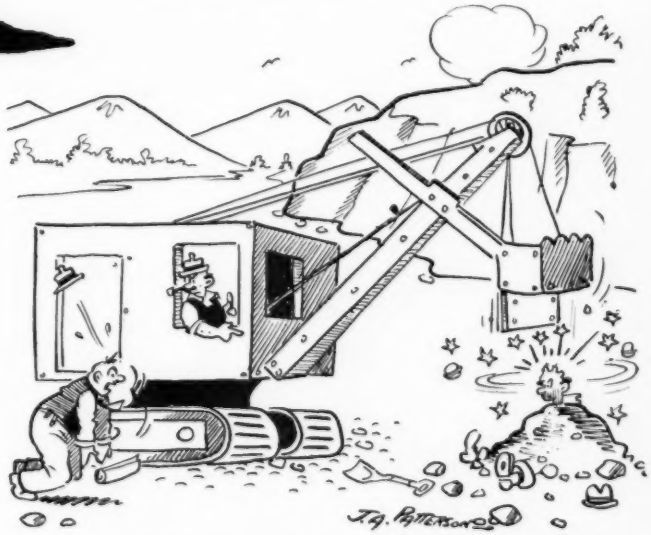
"You said it's up-to-date! Joe's ever got a little portable bar in there for himself!"



"Rock-a-bye baby!"



"Idiot! I said grab that winch—not that wench!"



"I told him I wuz gonna do it someday—if he didn't stop singin' that 'Pennies from Heaven' ditty!"

Stripping Coal at Bobolink

(*Continued from page 207*)

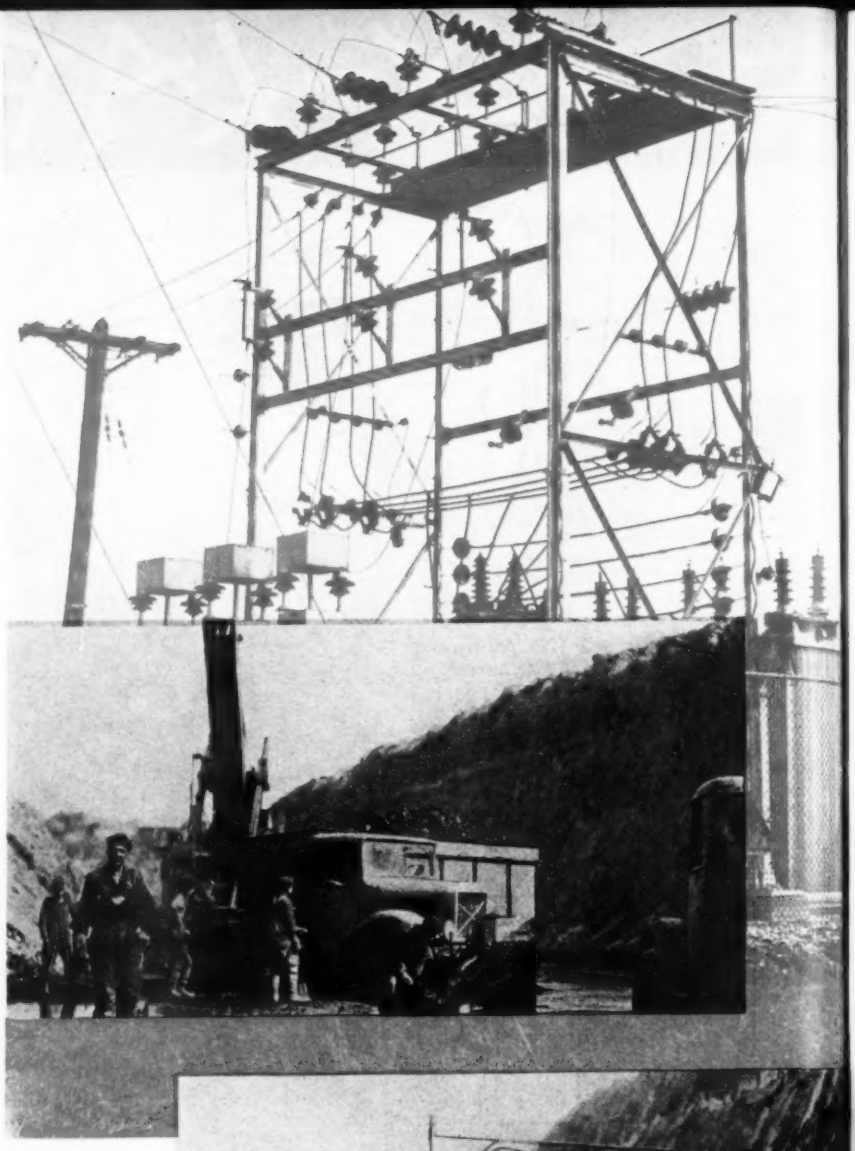
bad one, but we've found the shovel had plenty of power just to walk right straight through 'em." The one particular slide Mr. Steiger told us about occurred when the machine was on a slanted surface, and the cats were tipped. The slide was so heavy that it was feared the combination of tilt and extra pressure might even upset the machine. However, the ground operator turned on all the power he had, and the machine walked out of the danger in time.

At the time we visited Bobolink, the big stripper was moving about 28,000 yards per 24-hour day.

The shovel operates continuously except for a 15-minute shut-down at the beginning of each shift for greasing the front end and counterbalanced hoist sheaves. No major shut-downs have been necessary since the shovel began opening up the pit in the Fall of 1935.*

Loading Out the Coal

Coal is being loaded out of the pit in 30-foot-wide strips, the berm of 30 feet of exposed coal next to the high bank being used as a hauling road. The coal loader is a Bucyrus-Erie 75-B electric



*Interesting statistics of the 950-B are: Total motor horse power, 2400. Boom length, 105 feet. Dipper stick length, 72 feet. Dumping height, 74.5 feet. Dumping radius, 113 feet. Cutting height, 96 feet. Cutting radius, 122.5 feet. Working weight, 2,575,000 pounds.

The surprisingly low weight of this machine, particularly the new-type front end, in view of the strength it has shown, is what has particularly impressed Pit Boss John Hamm at the Bobolink Mine.

● The red background picture is of the substation near the mine office, where current is stepped down from 33,000 to 4400 volts. Top black picture shows a loaded truck cramped ahead of the 75-B, with an empty on the way by to loading position. Power cable is carried over the berm on the frame shown in the center. Fairbanks-Morse pumps like that shown at the bottom lift water from pit to lateral drainage ditches. Pumps are mounted on skids for transportation around the pit.

with 3¼-yards special coal loading dipper.*

Ahead of the 75-B, a Sullivan channel-cutter shapes the berm. This machine is really an endless saw, powered by an electric motor. The feature of the rig is that it cuts a perfectly straight berm, along the exact line desired. In a seam as narrow as this one, Engineer Loudermilk estimates that the channel cutter will effect a saving in coal recovery of up to 10 per cent.

Shaking Up the Seam

The seam is lightly shot ahead of the loader—just enough to "shake up" the coal slightly. An ingenious drill is used to put down the hole required for this shooting. The drill itself, using an electrically-powered vertical auger bit, was manufactured by the Hardsocg Wonder Drill Company, and the rig was mounted on a modified Ford truck chassis at Bobolink. With this set-up, a couple of men handle necessary moving—and there is considerable to do. Three-foot-deep, 2¼-inch holes are put down, and shot with ½-pound Atlas "Blackstix." Atlas electric blasting caps are used.

All together, a ground crew of about 14 men handle the berm cutting, drilling and blasting, as well as pulling in the loose coal immediately ahead of the 75-B for minimum loss in loading. The loading shovel is operated by one man, an oiler coming on for the last hour of the shift to get the machine in shape for the next day's operation. Loading by the 75-B, and all pit work except that of the stripper is handled on a single seven-hour shift daily.

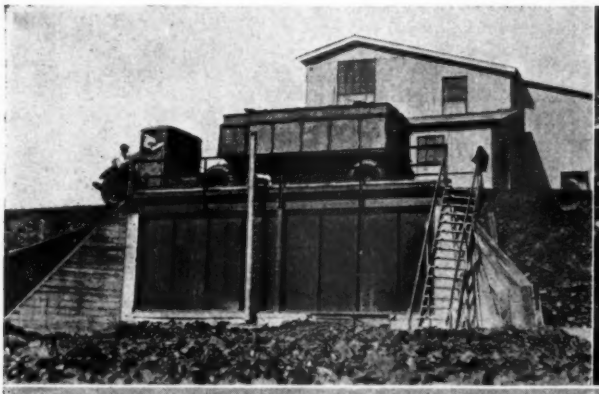
The Bucyrus-Erie shovel loads to five trucks—White tractors with 16-yard, bottom-dump Sanford-Day trailers. This combination loads and hauls an average of 2,000 tons of coal a day, with 2300 tons being the best day so far. The average ratio of yards of overburden moved to tons of coal loaded runs about 14 to 1.

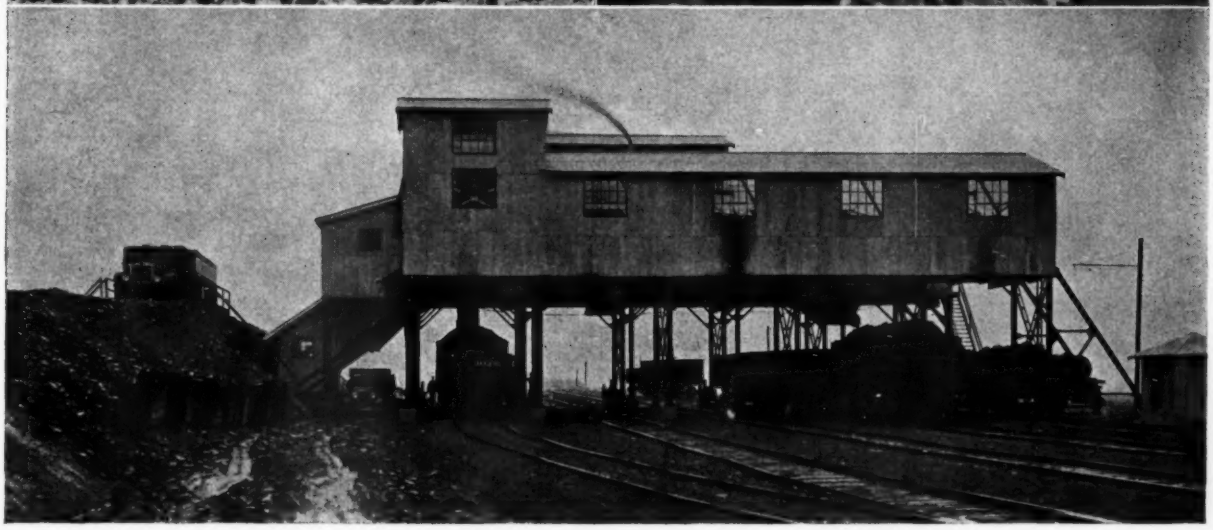
Hauling

Equipped with Firestone heavy duty tires, the trucks are at present operating on a round-trip haul of about ½-mile with maximum grade at 7 per cent. Average loaded speed is 20 miles per hour; average empty speed, 30 miles per hour. With the 950-B working between the loader and the

*A new-type lighter and larger, flat-faced Bucyrus-Erie coal dipper is on order and will shortly be installed to increase the dipper capacity to 4 cubic yards.

● Upper left: One of the trucks dumps its 16-ton load over the hopper at the tipple. Right: Most of the coal is loaded into railroad cars, but employees can get it in trucks. Bottom: The tipple at Bobolink. An average of 2,000 tons of coal per day is handled here.





● Top: Five cars at a time can be

Fastest Selling 3/8 yard

in 1934
in 1935
and in 1936
again in 1937

NEVER before has there been a more sensational success than the Bucyrus-Erie 10-B. Year after year, all over the world, this famous 3/8-yard big producer has maintained world leadership by giving owners extra value in bigger output, greater mobility, and outstanding dependability. Performance has built its reputation and sales tell the story. The 10-B is a machine worth knowing. Get complete information today.

BUCYRUS-ERIE

EXCAVATING, DRILLING, AND MATERIAL HANDLING EQUIPMENT... SOUTH MILWAUKEE, WISCONSIN, U.S.A.

● **Top: Five cars at a time can be loaded at the tipple. This view shows three different sizes being loaded. Center: Building up the spoil bank. Bottom: General view of the east end of the pit.**

road up out of the pit, the trucks pass between the stripper and the high wall—the ground operator of the big shovel serving as a traffic cop at this point. Ordinarily the trucks will pull up directly beside the 75-B and take on the load. Then the driver will cramp the trailer around ahead of the 75-B and pull out for the tipple. The speed with which these big units are handled is noteworthy. While a loaded truck is backing around, there is space for an empty to pull by and move in alongside the loader. Also, passing is possible on the 30 foot berm of the pit, and passing stretches have been provided on the road leading up out of the pit.

Trucks were selected for the hauling instead of a railroad system because of the definite advantages they offer in this mine. With trucks it is possible to load at the extreme end of the cut without turn around. The berm can be moved without extra expense, which makes it possible to work small bodies of coal impossible to handle profitably with a track system. Also, in a seam as thin as this one, track would have to be shifted every night with consequent jump in expense; while the flexibility of the truck system adds to speed and economy.

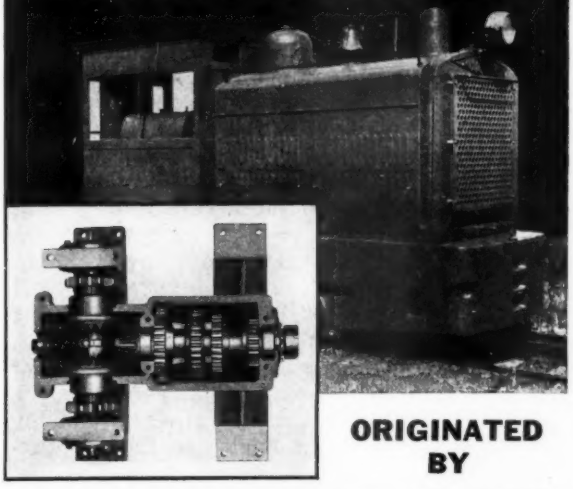
The outlet road is built of "gob" and resurfaced with crushed brick, gravel, and throw-out coal. Particularly in wet weather, road maintenance is a tough problem, and requires a crew pretty constantly on the job.

The wet weather has proved a handicap despite a well laid-out drainage system (shown in an accompanying map). A series of lateral ditches running out of the pit at frequent intervals carry water to a main ditch which drains it off the property. Seven Fairbanks-Morse 4-, 5-, and 6-inch pumps are used to pump water from the pit into the laterals.

Source of Power

All equipment in the pit is electrically powered. Three-phase, 60-

THE LOCOMOTIVE TRANSMISSION



ORIGINATED BY

WHITCOMB

● An important part of a locomotive is the transmission. It gears the power to the load, and must be strong enough to carry the full engine torque at rated speeds.

● The standard Whitcomb, selective-gear type transmission, providing four speeds in either direction, was originally designed by The Whitcomb Company, and has been accepted as the standard design for all heavy-duty, internal-combustion locomotives. It delivers a larger proportion of the engine power to the rails and contributes to economical operation.

● In larger sizes, the gears are constantly in mesh. Engagement is effected by stepped jaws in the faces of gear hubs. All gears, sprockets and shafting are alloy steel. The heavy-duty roller chains are made of alloy steel. Shims in journal boxes provide for take-up. Bearings are heavy-duty ball or roller type.

A SIZE AND TYPE TO SUIT YOUR NEEDS

Gasoline or Diesel Mechanical Drive
Gasoline or Diesel Electric Drive
Electric Storage Battery
Electric Trolley
Combination Trolley—Storage Battery

Whitcomb Engineers will survey your requirements and estimate the savings you can make by investing in Whitcomb equipment.

THE WHITCOMB LOCOMOTIVE COMPANY

Subsidiary of The Baldwin Locomotive Works.

Plant at Rochelle, Illinois. All sales made by The Baldwin Locomotive Works, Paschall Station Post Office, Philadelphia, Pennsylvania.

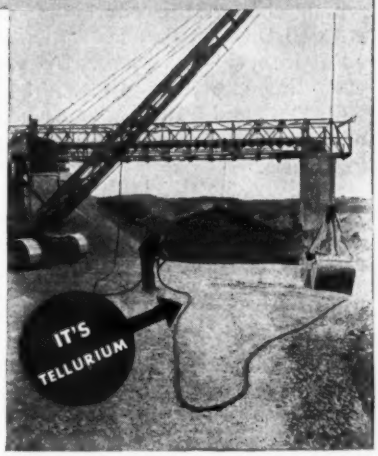
WHITCOMB LOCOMOTIVES

Cement Clinker Cuts like Emery ... But CABLE Not Worn At All

Thus writes William Fowden, *plant manager of The South Dakota Cement Plant, Rapid City, S. D.*

Part of Mr. Fowden's letter is as follows:

"*. . . and I am more than satisfied with the cable we are using on our electric shovels and electric yard crane. It is pulled around in a pile of cement clinkers which has almost the cutting properties of emery. As yet we have not had any trouble with the cable, and cannot see that it has worn at all.*"



A visitor closely examines the G-E Type W three-conductor tellurium-rubber cable, in use at the South Dakota Cement Plant, and can find no signs of wear

Four Years' Service

This cable is a G-E tellurium-cured all-rubber type, three-conductor, No. 2 Awg.

It was installed in January, 1932, and when a G-E representative examined it on October, 16, 1936 he found little signs of wear, despite this nearly four years of hard service. It was once run over by a 75-ton steam locomotive, and the jacket was somewhat damaged, but a simple jacket repair put it back in service.

Tellurium-cured

The jacket on this G-E portable cable is cured or vulcanized by a special G-E process, using the element tellurium. The process results in a protective covering that is not only tough and capable of resisting abrasion, but which is also long aging and able to withstand the rays of the sun.

A Type for Every Use

You can get this G-E portable cable in every type and size, one of which is best suited for a coal-cutting, loading, or conveying machine—for an electric shovel, crane, hoist, or dredge—for a portable motor or compressor—for an arc-welding machine—in fact, for every kind of portable electric equipment.

May we send you a copy of our Bulletins GEA-1728 and GEA-1918, which give prices and specifications? Address nearest G-E sales office, or General Electric, Dept. 6C-201, Schenectady, N. Y. 520-107

GENERAL ELECTRIC

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

cycle current comes into the mine sub-station at 33,000 volts, from the Indiana Power Service Dresser power station. At the sub-station, current is stepped down to 4400 volts, at which voltage it goes directly into the 1000 h.p. main motor of the 950-B. This motor drives four generators which change the current from A.C. to D.C. Transformers, located at intervals parallel to the pit, step the current down again to 440, 220, and 110. The majority of the pit equipment operates on 220 volts.

All motors on the two shovels are General Electric, "Simplex" power cable, manufactured by the Simplex Wire & Cable Co., being used with the shovels.

Aaron Slover is electrician for the Bobolink Mine, and does his trouble-shooting in a flood-light-equipped Chevrolet run-about truck.

Roebling wire rope is used on the shovels. The rope crowd on the 950-B has been of particular interest because it is the first time big stripping shovels have had this type of crowd. Its successful operation on similar service has been proved, however, by many years of successful operation on big Bucyrus-Erie dipper dredges. Superintendent Steiger says that, although the rope crowd has not been in service long enough to afford an accurate comparison with the cost of maintaining the old rack-type crowd, the new crowd has proved smoother and faster in operation than the old rack-crowd and has stood up well.

Dumping Coal at the Tipple "On the Fly"

When the loaded trucks come up from the pit, they run up a short incline to a steel dumping platform placed above the 75-ton hopper. The ingenious dumping system, while it has been used on railroad cars, is comparatively new on trucks. Two latch rods, controlling the bottom doors of the truck body, protrude slightly from the side of the truck. As the latter comes up between the side rails onto the platform, a rail trips these rods, the doors of the dump bottom swing down between the wheel tracks into the opening of the hopper, and the coal dumps by gravity. The truck then proceeds off this platform; the hanging doors being closed by contact with a spring latch set almost level with the surface at the end of the platform.

With this system trucks dump so fast that it seems to an observer that they scarcely come to a stop on the platform. We were told, however, that it takes an average of 20 seconds to dump a 16-yard load.

● Mine office at right, in front of which can be seen the platform of the scale. Switching is handled with this I.R.R. electric locomotive.

Four-Set Screens Give Excellent Separation

From the hopper, the coal goes into a 2000-ton crusher, and then is moved by a feeder onto a 200-foot endless steel conveyor which takes it to the top of the tipple. A shaker screen, operating at 3600 r.p.m. starts the coal on its journey over the sets of screens which separate it into five sizes, or any desired combination of the five. Four sets of screens, instead of the ordinary two are used, adding to the accuracy of separation.

The sizes made are 6″ lump; 3″ x 6″; 2″ x 1¼″; 2″ x 3″; and 1¼″x0″. Five conveyors carry the separated sizes to loading chutes. When a combination of sizes, or run-of-mine shipments are desired, another conveyor, running at right angles to the five previously mentioned, carries the mixture to the desired chute.

Coal is loaded directly to freight cars, which are then run by gravity to a big Winslow scale in front of the mine office. Switching is handled by an electric locomotive furnished by the Indiana Railroad Company. This electric line, which hauls the coal out, connects with the Pennsylvania two miles from the tipple, and with the Chicago, Milwaukee and St. Paul at the edge of Terre Haute.

Provision is made at the tipple for one chute to load directly to trucks, and coal sold to employees

A TRAILER FOR
Every Heavy Duty Requirement

Trailers of all types and up to any capacity.

Write or Wire

C. R. Jahn Co., Builders Bldg., Chicago

Any Width to 14 Ft.--
Laid Smooth as Velvet--
Faster than Your Plant Can Mix

With its 18 ft. straight-edge runners to equalize the surface, its semi-crawler traction all on hard subgrade, its pug-mill spreader, its ability to blend smooth joints and adjustability up to 14 ft. widths—the Jaeger Paver lays precision smooth pavements, faster and at lowest known cost. Send for Catalog and Prices.

THE JAEGER MACHINE CO. 553 Dublin Avenue Columbus, Ohio

World's Largest Builder of Spreading and Finishing Machines

JAEGER *Bituminous* **PAVER**

HAYWARD BUCKETS

GOOD FOR YEARS OF HARD SERVICE

A HAYWARD Bucket is an investment not a gamble. It helps you make a profit on every job.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

Gatke QUALITY

ASBESTOS BRAKE and FRICTION BLOCKS

WOVEN BRAKE LINING

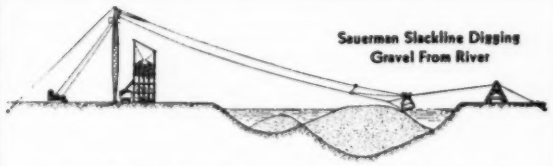
HYDRAULIC COMPRESSED BRAKE LINING

Their performance record is their recommendation

. . . ease of operation, no slipping or grabbing, longer life, fewer adjustments and maximum safety.

Correct your brake, friction and clutch problems economically by specifying Gatke Quality materials. Our Engineers will assist you — without obligation.

GATKE CORPORATION
General Offices
228 North La Salle St. Chicago, Illinois



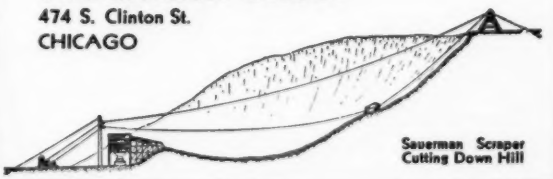
Sauerman Slackline Digging Gravel From River

MORE YARDS per DOLLAR

The first cost of a Sauerman Slackline or Drag Scraper machine for the average long haul job is less than the cost of any other equipment that will *dig, haul* and *place* an equal yardage of materials. Moreover, a Sauerman machine is easy to operate and demands little by way of repairs, assuring a minimum daily expense.

If you contemplate any work that requires moving sand, gravel, clay, loam or bulk materials distances of 100 to 1500 ft., you should send for the Sauerman Catalog and look over the evidence of the many different long haul jobs that have been handled at great profit with Sauerman machines. Whether you wish to dig 100 cu. yd. per day from a gravel pit or to build levees at the rate of 15,000 cu. yd. per day, you will find illustrations and data in our catalog that will help you in solving your problem.

SAUERMAN BROS.
474 S. Clinton St.
CHICAGO



Sauerman Scraper Cutting Down Hill

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

is handled in this way. Tipple-foreman Dave Gideon has a crew of 30 men working in the tipple and on the cars. Tipple machinery including hopper and crushers, was manufactured by the Pittsburg-McNally Company. Twenty G-E motors, ranging from 5 h.p. to 50 h.p., provide the power. Control is by push-button, and can be handled by one man.

Maintaining Equipment in Top Notch Shape

A well-equipped shop with a regular crew of seven men takes care of practically all necessary repair work. The largest section of the shop is the garage where trucks are greased and inspected after every shift. Regular and thorough checking keeps the trucks constantly fit for their tough job. With tires, especially being watched for pressure and wear, and spares kept ready for emergency use.

Another section of the shop houses the equipment necessary to handle milling and lathe work for the mine. Two welding outfits, electric and acetylene are available; Oxweld rod and Smith-Knoxville torches being used. The electric welder, a 400-amp. Lincoln, is mounted on an old Ford chassis so it can easily be pulled down to the pit and plugged in for service there. Shovel teeth are rebuilt by welding in the shop.

Next to the shop are storage sheds where a stock of repair parts is maintained. This stock is kept pretty complete in order to avoid shutdowns in case of trouble or break-down of any equipment.

The mine also maintains facilities for storing tank car lots of gasoline, about 8000 gallons a month being used by the company and sold for employee-owned cars.

There are about 100 men on the payroll of the Bobolink Mine. When they get through with a good shift's work, they are likely to be as hidden by grime as most miners. They can get rid of this, however, in the wash-house near the office, where showers and lockers are provided. Heat for shower water, as well as for heating surface buildings is furnished from the adjacent steam plant.

Personnel

Executive personnel of the Binkley Mining Company is: Hubert E. Howard, President; C. F. Hamilton, Vice President in charge of operations; W. G. Gregory, Vice President in charge of sales; G. A. Merchant, Secretary and Treasurer; B. H. Schull, General Manager; F. M. Schull, General Superintendent; A. E. Steiger, Superintendent of Bobolink Mine, D. Loudermilk, Engineer of Bobolink Mine.

Operators on the 950-B are: Arnold Fulk, William Kerr, Sam Slavens, and Howard McCalpin. Leo Ritter is operator of the 75-B coal loader.

Book Reviews

A booklet recently published by the Portland Cement Association contains condensed practical information on concrete piles. The field engineer and contractor will be particularly interested in the description and photographs of the manufacture, handling and driving of concrete piles. For the designing engineer there are sections on soil structure for pile foundations, bearing power of piles, design of precast piles for handling stresses and a section on the design of sheet pile bulkheads. Cast-in-place as well as precast piles are discussed. The booklet is available without charge by request to the Portland Cement Association, 33 West Grand Avenue, Chicago, Illinois.

"Good Roads" is the name of an interesting pictorial 52-page catalog on standard material-handling machines manufactured by Barber-Greene Co., of Aurora, Illinois.

The catalog contains detailed information on, and excellent photograhps of travel plants, central and batch plants, bituminous finishers, bucket loaders, belt conveyors, conveyor applications, etc. It may be had free upon request to Barber-Greene Company.

Help Wanted

DIESEL OPERATORS WANTED

Two operators experienced in running small Diesel combination shovel-draglines wanted by South-American Oil Company. Sail about May 1st. Living quarters and board furnished. State salary expected. Give references. Write all information in first letter. Box 8804.

QUARRY SUPERINTENDENT

For 500,000 tons annual Crusher production. Required: Active and ambitious man with experience for steam, electric and gasoline equipment. Applicant must be well qualified for successful planning of operation and leadership for organization. State education, experience and family status. Box 8803.

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o EXCAVATING ***at South Milwaukee, Wisconsin***

SALESMAN

Excellent personality, single, young, five years experience as quarry superintendent, material man and junior engineer in construction work, etc. Also approximately year of successful selling; wishes permanent connection with good equipment or supply firm for Georgia, Florida, or foreign territory. Available May first. Prefer commission basis. Box 8801.

OPERATOR

25 years' experience on all makes of machines, gas, electric, Diesel, and steam. Has done dragline, shovel, crane, and clamshell work. Can do own repairs; furnish best references. Willing to go anywhere. Now located in Ohio. Box 8701.

DRILL OPERATOR

Drill Boss and blaster; 12 years' experience on Air Drill and well drill open-cut work. 34 years of age; married; best of references. Will go anywhere. Now located in Pennsylvania. Box 8702.

EXPERIENCED OPERATOR

Experience covers 15 years as dragline, clamshell operator on Diesel and gasoline machines; levee, highway and canal work. Prefers work on Monighan or Northwest. Single, age 31. Can do own repair work and furnish reliable references. Will go anywhere; now located in Louisiana. Box 8703.

OPERATOR

Experienced operator desires position; will take work anywhere. Has 17 years' experience; two on shovel work, nine on draglines, two on clamshells, four on cranes. Has operated steam rigs five years, electric two years, gasoline five years, Diesel five years. Prefers work on Bucyrus-Monighan or 41-B, steam or Diesel rig, one to six-yard size. Can do own repair work; 34 years old, married, can furnish good references. Now located in Ohio. Box 8601.

STEAM SHOVEL OPERATOR

Over 20 years' experience on steam machines on all kinds of construction work. Desire position on any make, size or type steam shovel. Age 50, will go anywhere; now located in Missouri. Can do own repair work and furnish best of references. Box 8802.